

Blueprint Denver

Industrial Land Study

Assessment of the Value of and Threats to Industrial Land

June 27, 2017



Economic & Planning Systems, Inc.

Denver

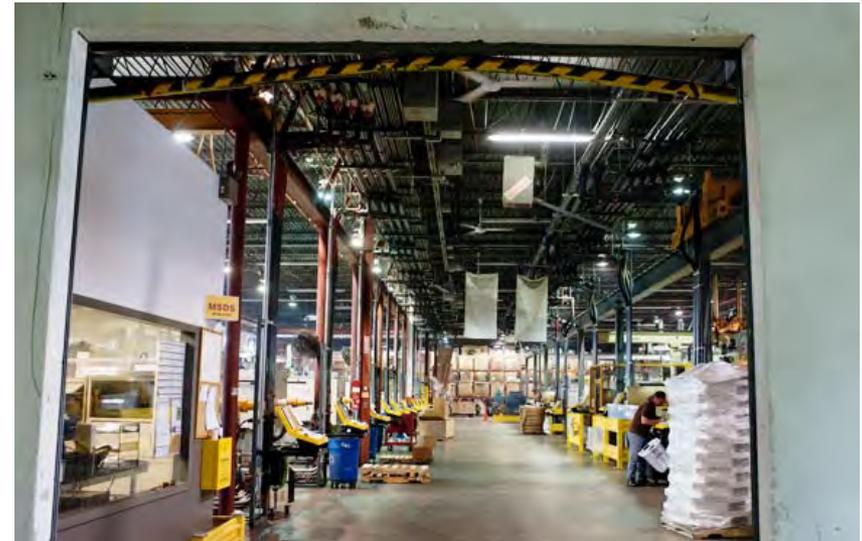
Los Angeles

Oakland

Sacramento

Outline

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 - Value of Industrial Uses
 - Trends in Industrial and Urban Manufacturing
- **Denver's Industrial Sector**
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- **Assessment of Values and Threats**
- **Recommendations/Next Steps**
- **Implementation/Toolbox**
- **Appendix**

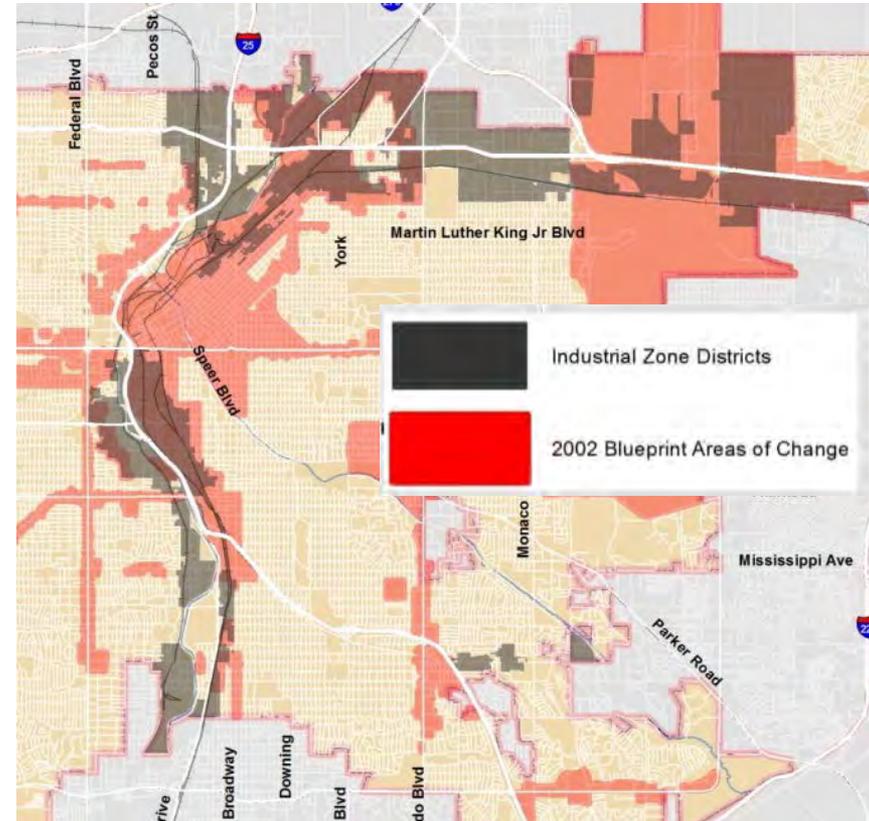


Intertech Plastics, a Denver-based manufacturing firm

Background

2002 Blueprint Denver

- Facing growth pressures for residential and desire to revitalize the urban core, the 2002 Blueprint Denver designated Areas of Change as the places best suited to capture the vast majority of new development
- A significant portion of the Areas of Change overlapped with industrial areas, as these areas were good candidates for redevelopment
- As Denver revises Blueprint, an understanding of the value of industrial areas is needed to gauge if and where the City should consider preserving industrial uses



Map with industrial zoned areas, the 2002 Blueprint areas of change, and the overlap between the two.

Background

Key Questions

- What value do industrial uses provide, and why may it be important to preserve them?
- What is the optimal amount of industrial land in the City over the planning horizon?
- Where are Denver's current areas of industrial, and what are their strengths and weaknesses?
- What are the types of industrial spaces and areas in the City? What are their characteristics and conditions?
- What are the recent and future trends in urban manufacturing and industrial uses? How do Denver's areas and buildings need to adapt to address these trends?
- *What industrial areas in Denver should be preserved, and what areas should be allowed to be converted as part of new development?*



Hookfish Manufacturing, a screenprint manufacturer in Denver

Background

Industrial Definition and Categorization

- Industrial and manufacturing sectors are defined based on two-digit NAICS codes and categorized as manufacturing, logistics, or services:
 - **Manufacturing**
 - Manufacturing (NAICS Codes 31-33)
 - **Logistics**
 - Wholesale trade (NAICS Code 42)
 - Transportation and warehousing (NAICS Codes 48-49)
 - **Services**
 - Construction (NAICS Code 23)
 - Utilities (NAICS Code 22)
- **Industrial Zoned Districts** on map are defined as I-A, I-B and I-MX zones and anything that still has the old industrial zoning code



Manufacturing



Logistics

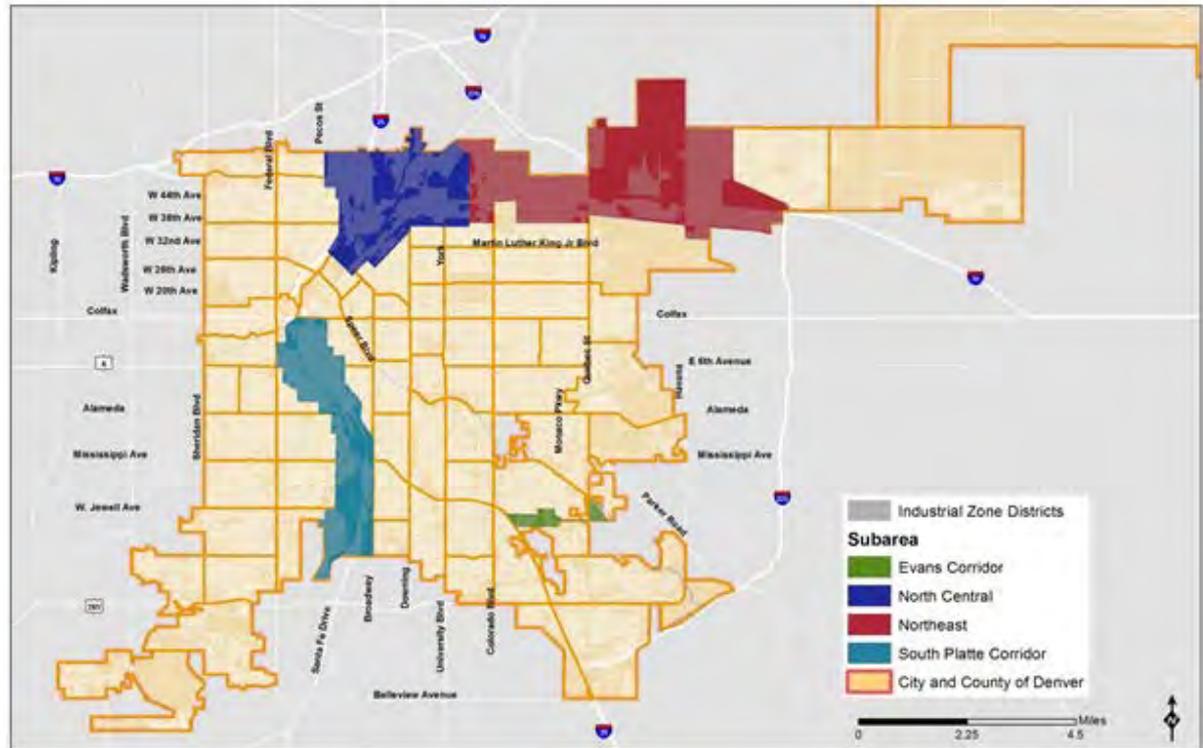


Services

Background

Industrial Subareas

- The analysis also focuses in on four industrial clusters in Denver
 - North Central
 - Northeast
 - Evans Corridor
 - South Platte Corridor
- These clusters account for 95% of the industrial space in Denver



Value of Industrial Uses

Employment

- For the City of Denver, the industrial sector employs 100,000 workers, which represents 21% of total employment
- Industrial jobs represent the same percentage of total employment for the MSA at approximately 283,000 jobs

Table: Denver and Denver MSA Employment (2015)

Description	Jobs	% Total
DENVER CITY AND COUNTY		
Industrial Jobs		
Manufacturing	21,123	4%
Logistics	57,306	12%
Services	<u>22,693</u>	<u>5%</u>
Subtotal	101,122	21%
Other Sectors	<u>377,249</u>	<u>79%</u>
Total	478,371	100%
DENVER MSA		
Industrial Jobs		
Manufacturing	68,431	5%
Logistics	125,341	9%
Services	<u>89,722</u>	<u>7%</u>
Subtotal	283,494	21%
Other Sectors	<u>1,094,379</u>	<u>79%</u>
Total	1,377,873	100%

Source: Bureau of Labor Statistics; Economic & Planning Systems

For more information see:

➤ Appendix A.3

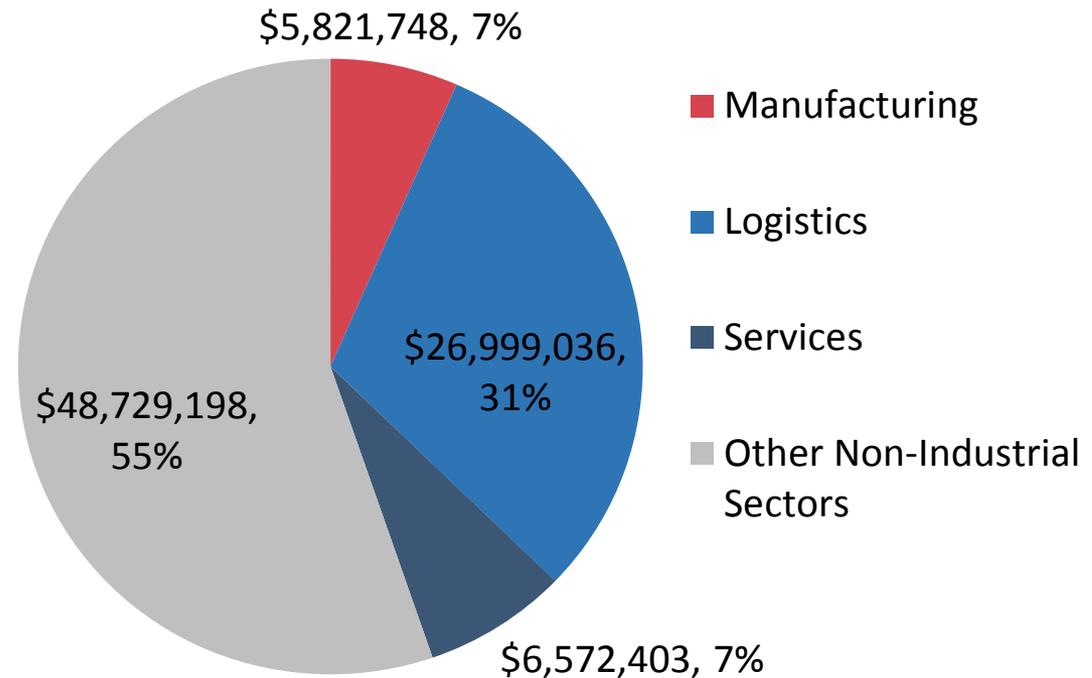


Value of Industrial Uses

Sales

- For the City of Denver, industrial uses account for \$39 billion in sales, which represents 45% of the City total
- Logistics represents the largest percentage of total sales at approximately \$27 billion or 31% of total sales
- Manufacturing represent a smaller percentage of total sales at 7%

Figure: Denver Sales in \$000s (2016)



Source: InfoGroup; Economic & Planning Systems

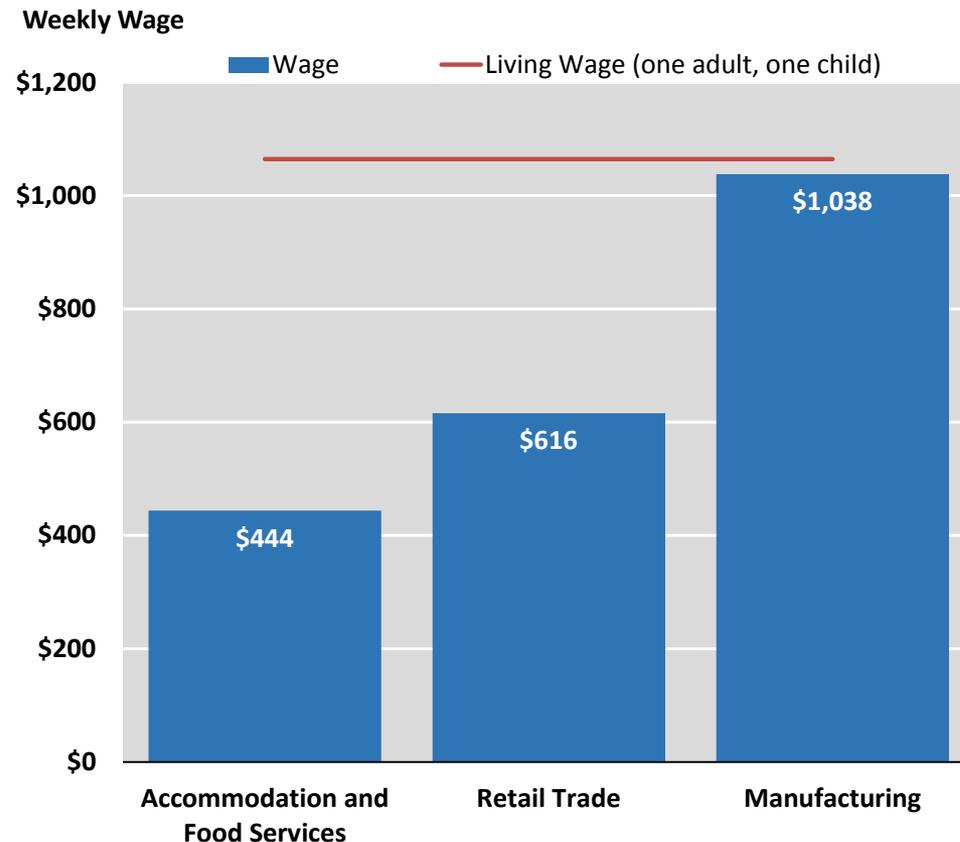
Note: Sales represents the volume of product generated by the company annually. InfoGroup estimates sales based on employment size and other factors related to the sales volume of the business.

Value of Industrial Uses

Middle Skill Jobs

- Jobs within industrial oriented businesses are an important source of “middle skill” jobs
- Manufacturing wages are typically higher than wages in other industries accessible to workers without a college degree
- Unlike service industries, manufacturing wages approach a living wage

Figure: Comparison of Average Weekly Wage and Living Wage in Denver (2015)



Source: Bureau of Labor Statistics; MIT Living Wage Calculator (one adult, one child measure); Economic & Planning Systems

For more information see:

- Pratt Center, “What Makes a City Run,” April 2016
- Sisson, Patrick, “How 4 cities are using manufacturing to build equitable economies,” Curbed, September 2016



Value of Industrial Uses

Fiscal Impacts

- Industrial uses contribute to Denver's fiscal health
- In EPS's experience, industrial properties typically provide (through real and personal property tax) a neutral or positive fiscal impact
- The total tax generated can vary greatly depending on the value of equipment within industrial buildings, as business personal property tax (i.e. equipment, furniture, vehicles, etc....) can generate substantially more annual tax revenue than real estate property tax
- For example, the Purina pet food plant and Pepsi bottling facility in North Denver each generate approximately \$750,000 to \$1 million in tax revenue annually, with over 85% of this revenue coming from personal property tax



Purina Pet Food Plant

Trends in the Industrial Sector

Small Urban Manufacturers

- Urban manufacturing today is largely occupied by small, specialized firms in collaborative and interdependent networks
- In Denver, 81% of manufacturing firms have fewer than 20 employees
- Manufacturers nationally have also been trending towards smaller footprints and fewer employees

Table: Denver Manufacturing Establishments by Employee Size Cohort (2016)

Number of Employees	Number of Establishments	% Total
1-4	373	33%
5-9	367	32%
10-19	178	16%
20-49	133	12%
50-99	46	4%
Greater than 100	43	4%
Total	1,140	100%

Source: InfoGroup 2016; Economic & Planning Systems

For more information see:

- ULI, "High Tech Manufacturers moving to smaller factories, bigger warehouses," *Urban Land Magazine*, November 2015
- Nisha Mistry and Joan Byron, "The Federal Role in Supporting Urban Manufacturing," *What Works Collaborative*, April 2011



Trends in the Industrial Sector

Small Urban Manufacturers

- Research has shown that small urban manufacturers (SUMs) are more productive when located in denser urban areas
- SUMs also tend to pay higher median wages with higher wage growth and skill development opportunities



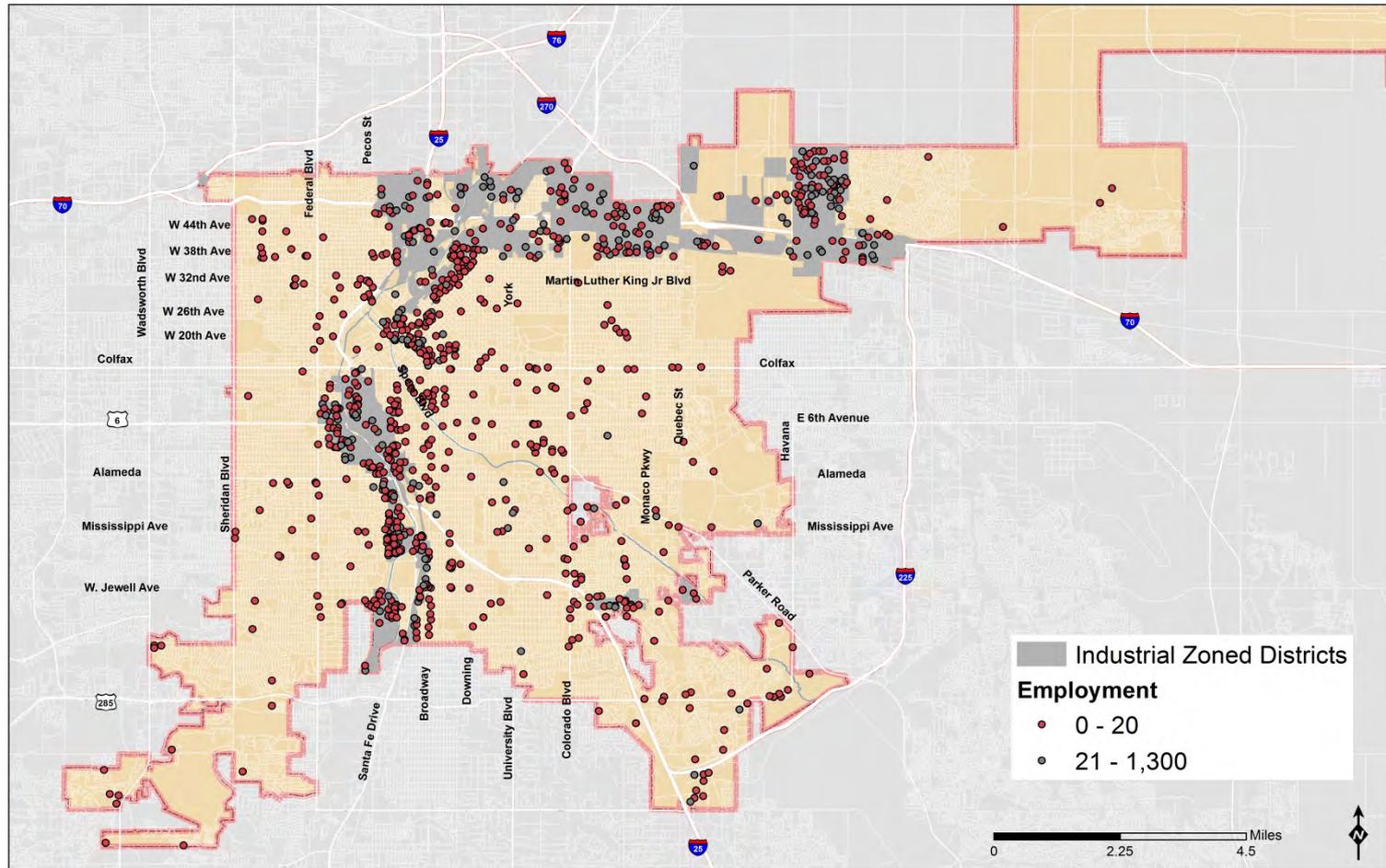
Never Summer, a Denver-based snowboard manufacturer

For more information see:

- Pratt Center, "What Makes a City Run," April 2016
- Sisson, Patrick, "How 4 cities are using manufacturing to build equitable economies," Curbed, September 2016

Trends in the Industrial Sector

Small Urban Manufacturers



Source: InfoGroup, Economic & Planning Systems

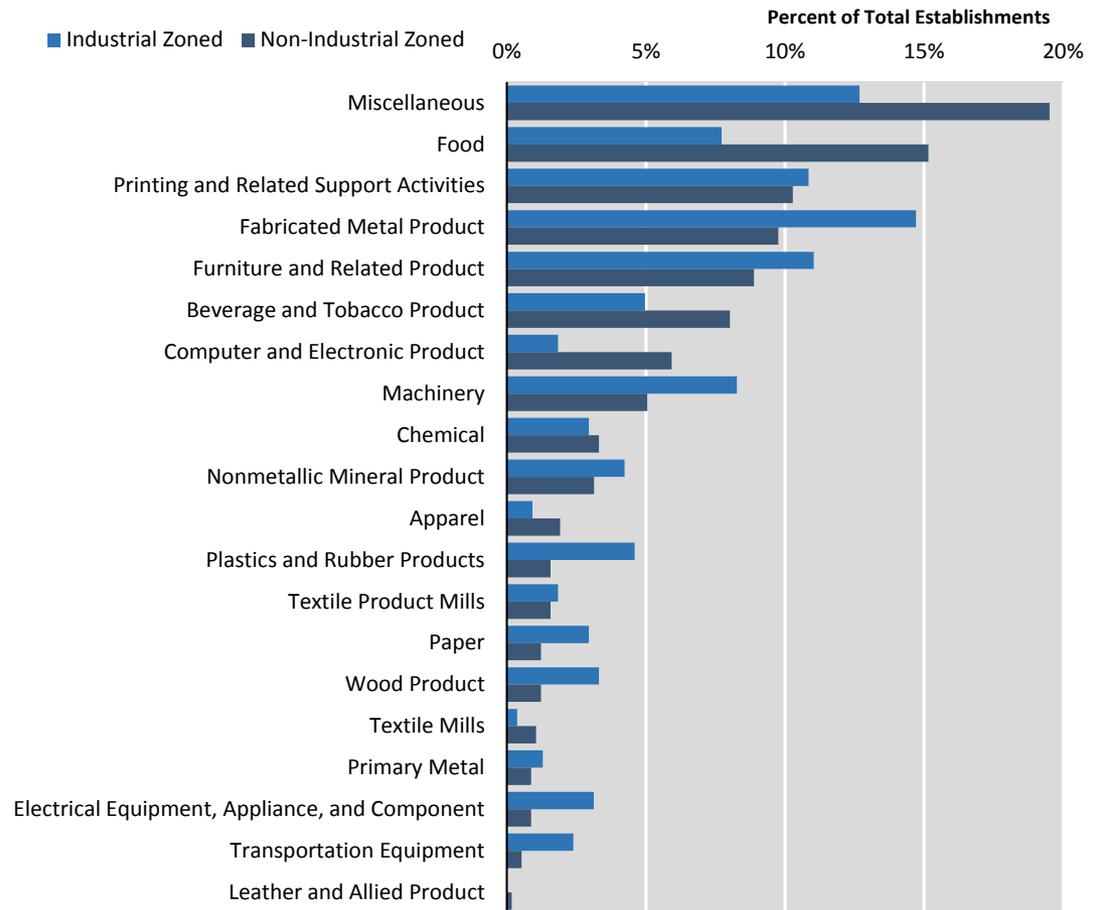
Map highlights the location of small urban manufacturers with fewer than 20 employees. **Industrial Zoned Districts** on the map are defined as I-A, I-B and I-MX zones and anything that still has the old code zoning.

Trends in the Industrial Sector

Small Urban Manufacturers

- SUMs are split evenly between industrial and non-industrial zoned areas
- While this suggests an ability for SUMs to be located in mixed-use locations, there is a slight difference to the types of SUMs located in the different zones. Food and beverage sectors tend to locate in non-industrial zones and more traditional and intensive sectors, like metal fabrication, tend to locate in industrial zones

Figure: Distribution of Manufacturing in Industrial and Non-Industrial Zoned Area



Source: InfoGroup; Economic & Planning Systems

H:\153106-Denver Blueprint Plan Update\Data\153106-Industrial Employment InfoGroup_v2.xlsx\W-SUMS Summary

Trends in the Industrial Sector

Logistics Space

- In the City of Denver and Denver MSA, logistics space has been the largest driver of employment, sales, and demand for space in the industrial sector
- E-Commerce has been a major driver of increased distribution spaces
- Industrial spaces for logistics activities look for larger floor plates, with higher ceilings



Recently opened Amazon Warehouse in Aurora, CO

For more information see:

- ULI, "High Tech Manufacturers moving to smaller factories, bigger warehouses," *Urban Land Magazine*, November 2015

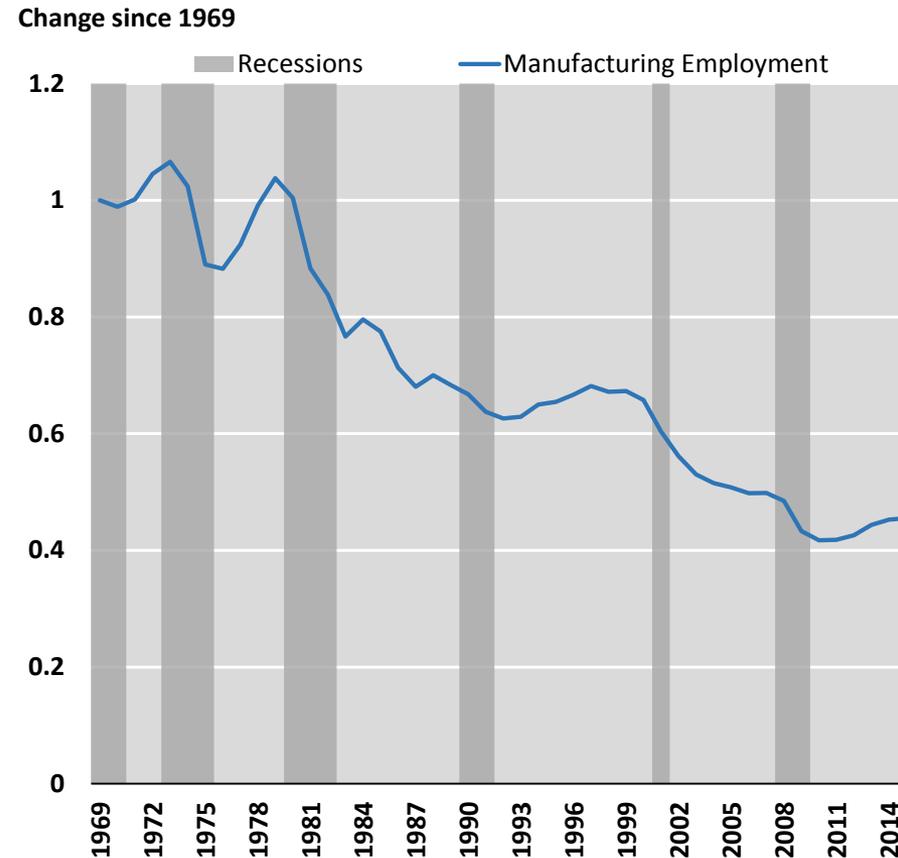


Trends in the Industrial Sector

Impact of the Recession

- Industrial employment has recovered slightly, but has not returned to pre-recession levels
- Sharp declines in industrial employment often are precipitated by recessions, and employment either continues to decline or fails to recover to pre-recession levels
- As a comparison, at the national level, manufacturing jobs are down 37% from their peak in 1979

Figure: Change in Denver's Manufacturing Employment (Base Year 1969)



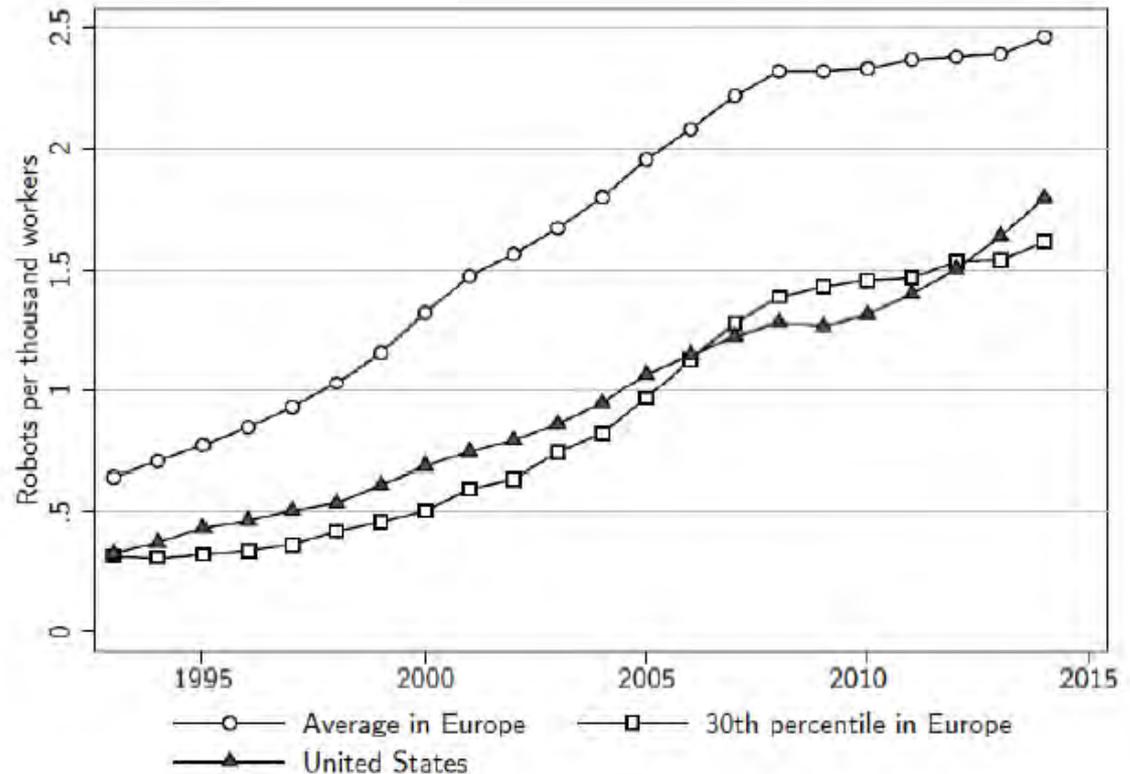
Source: Woodes & Poole; Economic & Planning Systems

Trends in the Industrial Sector

Automation

- The number of robots per capita employee has increased dramatically in the last 25 years
- Economists estimate that each additional robot reduces employment in a commuting area by 3-6 workers and wages by 0.25-0.5%
- The rate of robot substitution varies across industries, but manufacturing tends to have high factors

Figure: Change Robots per Thousand Workers in the United States and Europe



Note: Average and 30th percentile in Europe calculated from a selection of nine European countries.

Source: Acemoglu and Restrepo, NBER, March 2017

For more information see:

➤ Daron Acemoglu and Pascual Restrepo, "Robots and Jobs: Evidence from US Labor Markets," NBER, March 2017

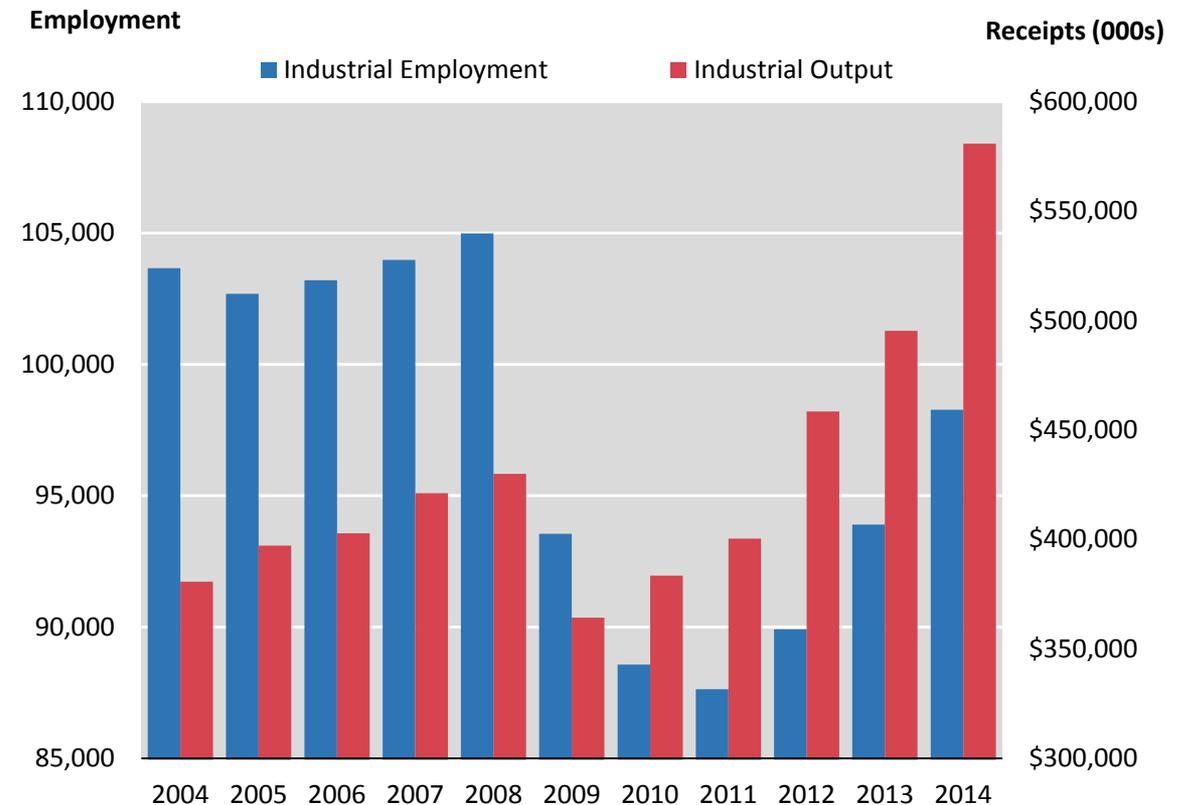


Trends in the Industrial Sector

Automation (cont.)

- While employment has shown a downward trend, output, as represented by sales, has increased over the same time period in Denver
- This inverse relationship between jobs and output suggest increased productivity, in part a result of automation and the changing nature industry
- The threat to Denver depends on its industry mix

Figure: Comparison of Industrial Employment and Output Trends in Denver



Source: Bureau of Labor Statistics; US Census Non-Employer; Economic & Planning Systems

Definition of Receipts: "Includes gross receipts, sales, commissions, and income from trades and businesses, as reported on annual business income tax returns. Business income consists of all payments received for services rendered by nonemployer businesses, such as payments received as independent agents and contractors."

Trends in the Industrial Sector

Urban Industrial Areas under Threat

- Industrial land is under threat in many of the fast growing metropolitan real estate markets
- Residual land values of industrial often can't compete with those of residential and commercial uses
- Industrial brokers in Denver cited increased land/property values and outmoded buildings as the most prevalent reasons for industrial uses moving out of the urban core and industrial buildings being redeveloped



Industrial warehouse building in Brooklyn, NY that was converted into residential lofts

For more information see:

➤ *Pratt Center, "What Makes a City Run," April 2016*

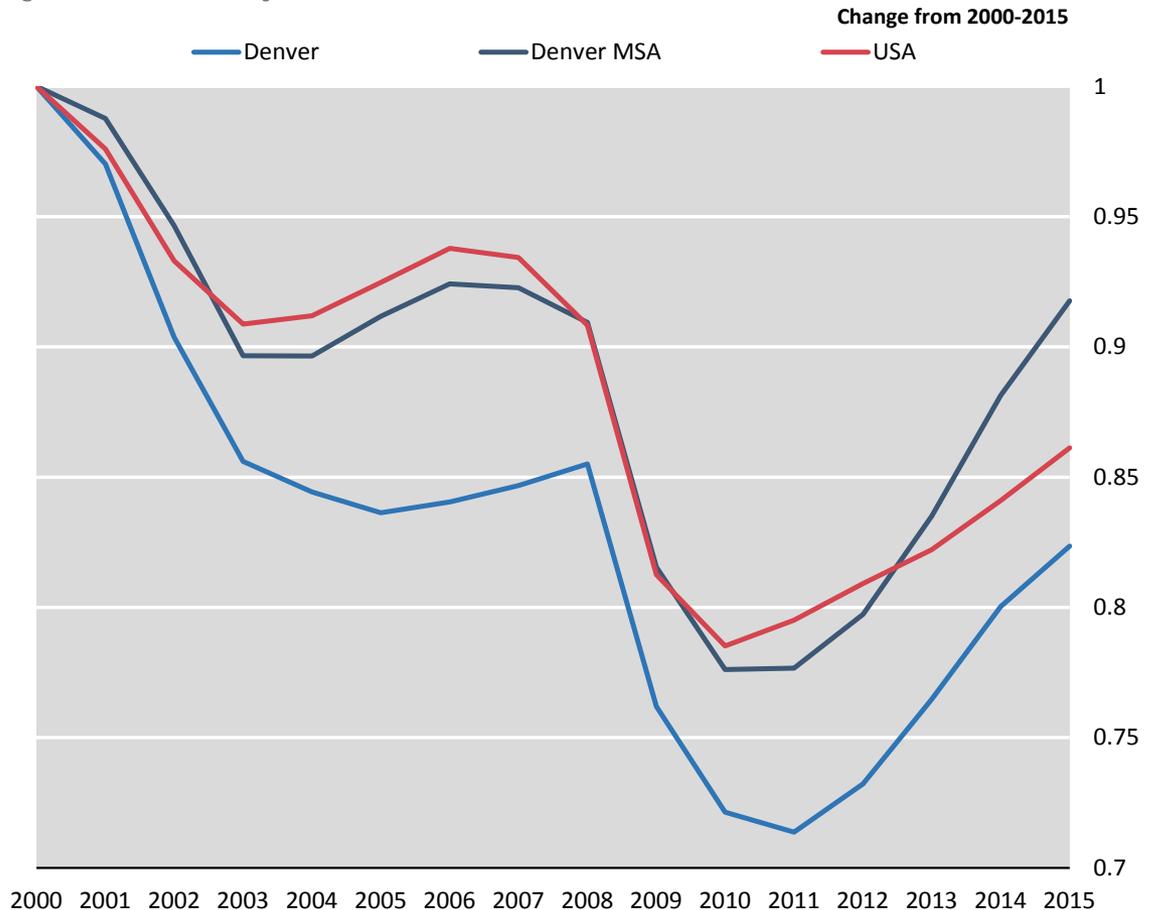


Demand Analysis

Employment Trends

- Since 2000, industrial jobs have declined in Denver, the MSA, and the nation
- Job decreased particularly quickly during recessions in the early and late 2000s, recovering subsequently but not to pre-recession levels
- Denver has performed slightly worse than both the MSA and nation, losing approximately 18% of industrial jobs since 2000

Figure: Denver County Industrial Job Growth



Source: Bureau of Labor Statistics; Economic & Planning Systems

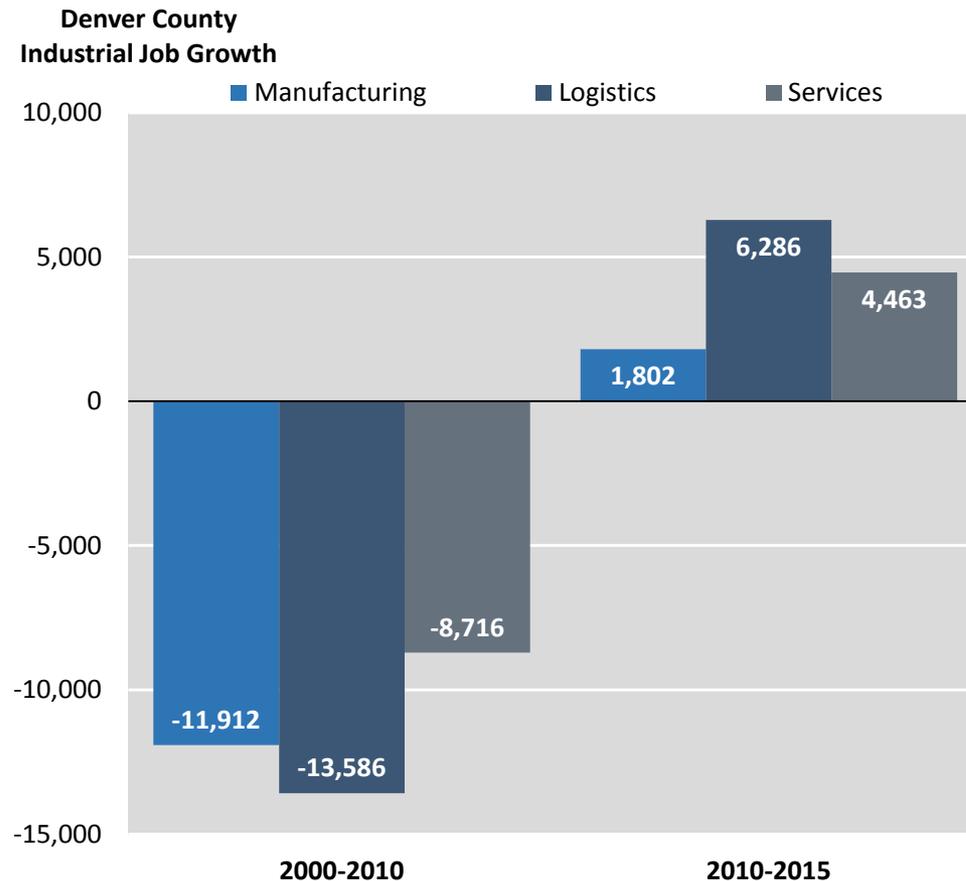
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Demand Analysis

Employment Trends

- Industrial jobs were hit hard during the recessions of the 2000s, losing a total of 34,000 jobs from 2000 to 2010
- Employment has recovered slightly, adding 12,500 jobs, but has not returned to post-recession levels
- Manufacturing has been the slowest to recovery

Figure: Denver County Industrial Job Growth



Source: Bureau of Labor Statistics; Economic & Planning Systems

For more information see:

➤ Appendix A.3



Demand Analysis

Growth Industries

- The largest employment growth in Denver has occurred in construction and logistics related industries
- Again, manufacturing has shown positive but modest growth compared to Logistics and Services

Table: Example of Growing Industrial Sectors in Denver (2010-2015)

Denver County Industrial Job Growth (2010-2015)	Code	Total
Manufacturing		
Electrical Equipment, Appliance, and Component Manufacturing	335	559
Printing and Related Support Activities	323	223
Fabricated Metal Product Manufacturing	332	223
Furniture and Related Product Manufacturing	337	201
Beverage and Tobacco Product Manufacturing	312	195
Subtotal		1,802
Logistics		
Merchant Wholesalers, Durable Goods	423	2,432
Air Transportation	481	1,460
Support Activities for Transportation	488	939
Merchant Wholesalers, Nondurable Goods	424	854
Transit and Ground Passenger Transportation	485	580
Truck Transportation	484	321
Subtotal		6,286
Services		
Specialty Trade Contractors	238	2,458
Construction of Buildings	236	2,207
Subtotal		4,463

Source: Bureau of Labor Statistics; Economic & Planning Systems

For more information see:

➤ Appendix A.4

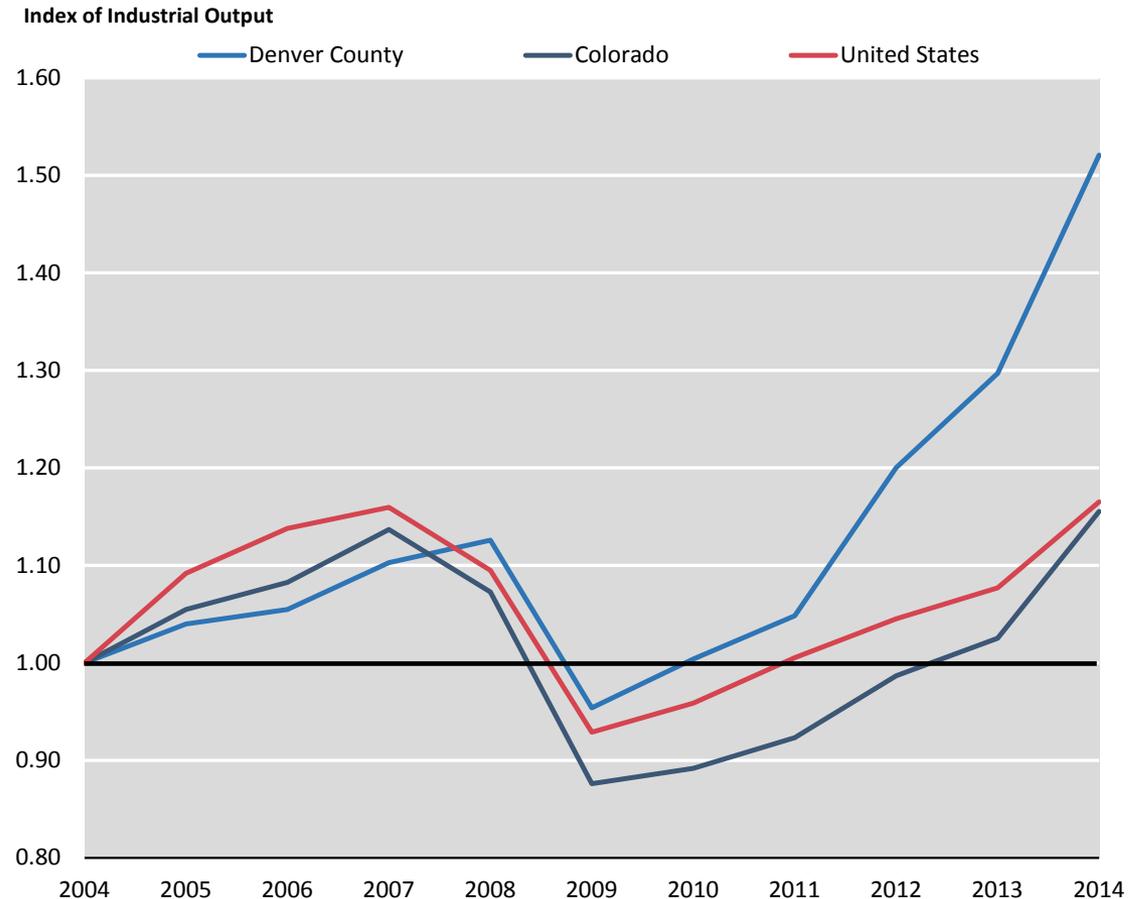


Demand Analysis

Output Trends

- While Denver lost more of its industrial employment base, its industrial sales have increased
- Since 2004, Denver's industrial sales have increased by over 50% compared to only 15% for the State and nation

Figure: Non-Employer Industrial Receipts as a Measure of Industrial Output Trends in Denver



Source: US Census Non-Employer; Economic & Planning Systems

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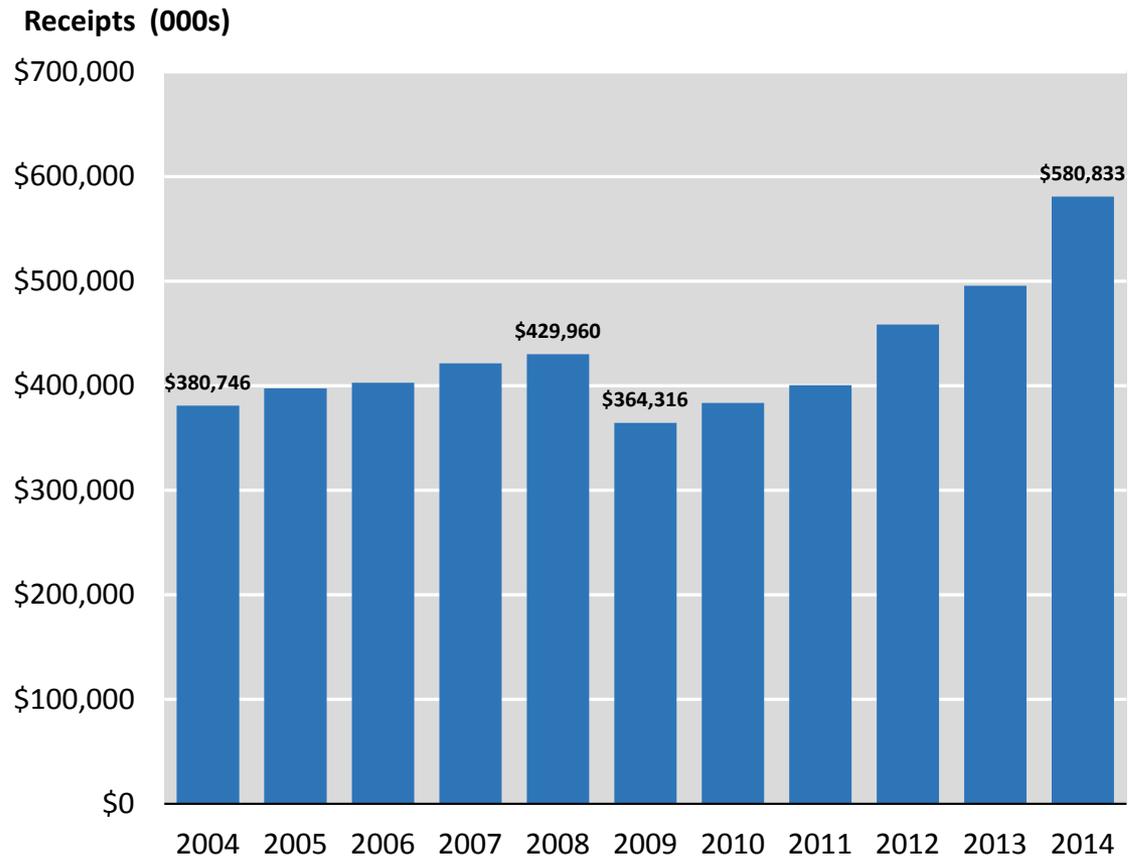


Demand Analysis

Output Trends

- While industrial employment has shown an overall declining trend since the 1970s, industrial output in Denver, as represented by sales, has increased and is currently above pre-recession levels
- This trend correlates to a national increase in efficiency and productivity of industrial uses, in part due to automation

Figure: Non-Employer Industrial Receipts as a Measure of Industrial Output Trends in Denver



Source: Bureau of Labor Statistics; US Census Non-Employer; Economic & Planning Systems

H:\153106-Denver Blueprint Plan Update\Data\153106-Industrial Economic Census.xlsx|T-Output vs. Employment Trends

Demand Analysis

Occupations

- Industrial-oriented occupations are defined as those occupations requiring low to middle skills that are important for the industrial sector
- Industrial occupations represent 21% of the Denver MSA workforce
- Other occupations represent 79% of the total workforce

Table: Industrial-Oriented and Other Occupations in the Denver MSA (2015)

Denver MSA Occupations	2015 Employment	% Subtotal	% Total
Industrial-Oriented			
Transportation and Material Moving	82,930	28%	6%
Construction and Extraction	64,880	22%	5%
Production	51,110	18%	4%
Installation, Maintenance, and Repair	50,910	17%	4%
Building and Grounds Cleaning and Maintenance	41,980	14%	3%
Subtotal	291,810	100%	21%
Other			
Office and Administrative Support	206,720	19%	15%
Sales and Related	155,440	14%	11%
Food Preparation and Serving Related	122,870	11%	9%
Business and Financial Operations	111,080	10%	8%
Education, Training, and Library	72,830	7%	5%
Healthcare Practitioners and Technical	72,500	7%	5%
Management	65,770	6%	5%
Computer and Mathematical	63,100	6%	5%
Personal Care and Service	44,510	4%	3%
Architecture and Engineering	36,740	3%	3%
Healthcare Support	33,610	3%	2%
Protective Service	28,340	3%	2%
Arts, Design, Entertainment, Sports, and Media	20,710	2%	2%
Community and Social Services	16,480	2%	1%
Legal	15,660	1%	1%
Life, Physical, and Social Science	14,500	1%	1%
Farming, Fishing, and Forestry	1,600	0%	0%
Subtotal	1,082,460	100%	79%
Total	1,374,270	---	100%

Source: Bureau of Labor Statistics; Economic & Planning Systems

For more information see:

➤ Appendix A.7



Demand Analysis

Industrial Occupations by Industrial Sectors

- Industrial sectors employ varying percentages of low to middle skill occupations from 26% in wholesale trade to 78% in construction
- Other occupations in industrial sectors include management, engineering, business and financial operations, etc.

Table: Percent of Industrial-Oriented Occupation in Industrial Sectors (2006-2010)

Denver MSA Occupations	Industrial Sectors			
	Construction	Manufacturing	Transportation and warehousing, and	Wholesale trade
Industrial-Oriented				
Building and Grounds Cleaning and Maintenance	0%	1%	1%	1%
Construction and Extraction	70%	2%	2%	1%
Installation, Maintenance, and Repair	4%	4%	6%	3%
Production	2%	35%	2%	3%
Transportation and Material Moving	2%	11%	44%	18%
Subtotal	78%	53%	55%	26%
Other	22%	47%	45%	74%
Total	100%	100%	100%	100%

Source: CTPP, ACS 2006-2010; Economic & Planning Systems



Demand Analysis

Industrial Wages

- Industrial-oriented occupations are well-paying jobs when compared to food preparation and personal care jobs, which require similar education levels
- However, industrial occupations are not the only well-paying middle skill jobs

Table: Wage of Industrial-Oriented and Other Occupations in the Denver MSA (2015)

Denver MSA Occupations	2015 Wage	% Total
Industrial-Oriented		
Transportation and Material Moving	\$32,837	69%
Construction and Extraction	\$41,958	89%
Production	\$32,627	69%
Installation, Maintenance, and Repair	\$47,217	100%
Building and Grounds Cleaning and Maintenance	\$24,091	51%
Other		
Food Preparation and Serving Related	\$19,471	41%
Personal Care and Service	\$22,216	47%
Office and Administrative Support	\$37,029	78%
Sales and Related	\$30,436	64%
Healthcare Support	\$31,711	67%
Protective Service	\$36,132	76%
Weighted Average	\$47,375	100%

Source: Bureau of Labor Statistics; Economic & Planning Systems

For more information see:

➤ Appendix A.8



Demand Analysis

Location of Establishments

- Not all industrial firms are located in industrials zoned areas – due both to the fact the industrial sectors include managerial jobs and to industrial uses located outside of industrial zones
- This is especially true for SUMs
- However, 60% of large industrial firms (>20 employees) are located in industrial zoned areas

Table: Location of Industrial Establishments

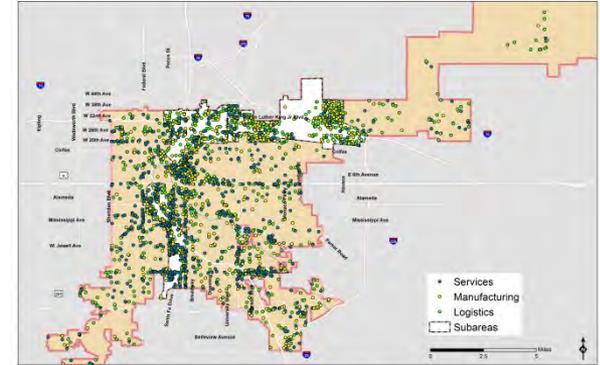
Description	Total		Industrial Zoned		Industrial Subareas	
	Count	% Subtotal	Count	% Total	Count	% Total
SUMs						
Manufacturing	943	18%	432	46%	489	52%
Logistics	1,620	32%	663	41%	784	48%
Services	<u>2,554</u>	<u>50%</u>	<u>416</u>	<u>16%</u>	<u>555</u>	<u>22%</u>
Subtotal	5,117	100%	1,511	30%	1,828	36%
Large Firms						
Manufacturing	197	31%	136	69%	155	79%
Logistics	250	40%	145	58%	178	71%
Services	<u>180</u>	<u>29%</u>	<u>93</u>	<u>52%</u>	<u>106</u>	<u>59%</u>
Subtotal	627	100%	374	60%	439	70%
All Firms						
Manufacturing	1,140	20%	568	50%	644	56%
Logistics	1,870	33%	808	43%	962	51%
Services	<u>2,734</u>	<u>48%</u>	<u>509</u>	<u>19%</u>	<u>661</u>	<u>24%</u>
Subtotal	5,744	100%	1,885	33%	2,267	39%

Source: InfoGroup; Economic & Planning Systems

Demand Analysis

Location of Jobs

- Jobs within the identified industrials sectors are located throughout Denver but most often along I-70 and I-25 within or adjacent to existing industrial zone districts (including I-A, I-B and I-MX zones)
- 57% of manufacturing establishments are located within industrial zoned areas
- While logistic establishments are also concentrated on the I-70 and I-25 corridor, only 24% of jobs are located within industrial zoned areas
- Service establishments are not as concentrated along the I-70 and I-25 corridor; 30% of jobs are located in industrial zones
- Employment within industrial sectors isn't always located in industrial buildings (e.g., headquarters located in office settings), and there is a high concentration of office jobs from industrial sectors located in downtown Denver



For more information see:

➤ *Following pages present maps of the concentration of jobs for each industrial category*

Demand Analysis

Location of Jobs

- While only 31% of industrial jobs are located in industrial zoned areas, a larger percent of firms are located in industrial clusters or subareas (defined later in the report)
- Moreover, large firms (>20 employees) tend to be more likely located in industrial zones and subareas. For example, 66% of large firm manufacturing jobs are located in industrial subareas

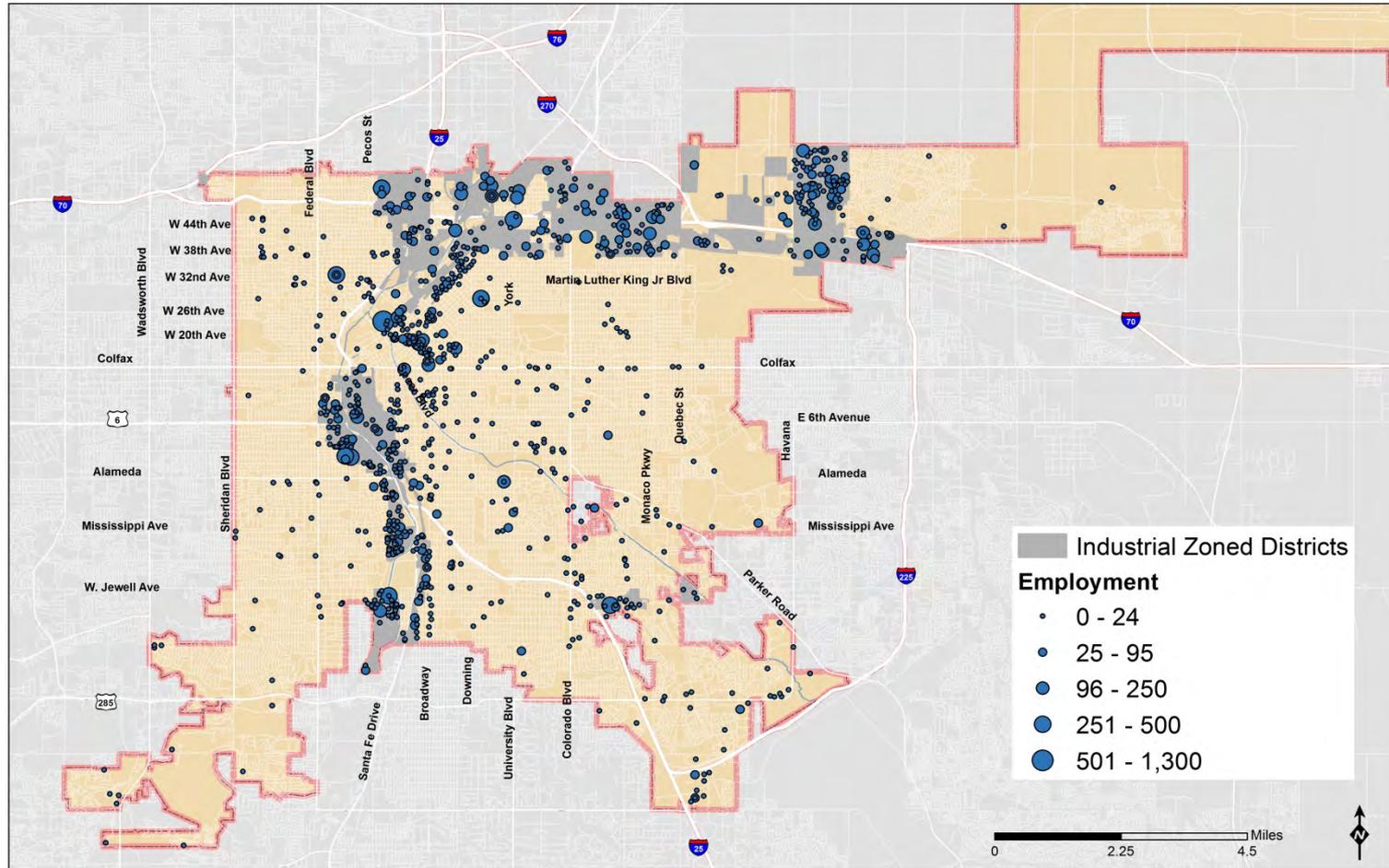
Table: Location of Industrial Jobs

Description	Total		Industrial Zoned		Industrial Subareas	
	Count	% Subtotal	Count	% Total	Count	% Total
SUMS						
Manufacturing	6,061	20%	3,188	53%	3,510	58%
Logistics	11,123	37%	5,300	48%	6,160	55%
Services	<u>13,094</u>	<u>43%</u>	<u>3,125</u>	<u>24%</u>	<u>3,924</u>	<u>30%</u>
Subtotal	30,278	100%	11,613	38%	13,594	45%
Large Firms						
Manufacturing	16,131	19%	9,446	59%	10,723	66%
Logistics	57,118	66%	10,756	19%	14,282	25%
Services	<u>13,023</u>	<u>15%</u>	<u>4,735</u>	<u>36%</u>	<u>6,305</u>	<u>48%</u>
Subtotal	86,272	100%	24,937	29%	31,310	36%
Total						
Manufacturing	22,192	19%	12,634	57%	14,233	64%
Logistics	68,241	59%	16,056	24%	20,442	30%
Services	<u>26,117</u>	<u>22%</u>	<u>7,860</u>	<u>30%</u>	<u>10,229</u>	<u>39%</u>
Subtotal	116,550	100%	36,550	31%	44,904	39%

Source: InfoGroup; Economic & Planning Systems

Demand Analysis

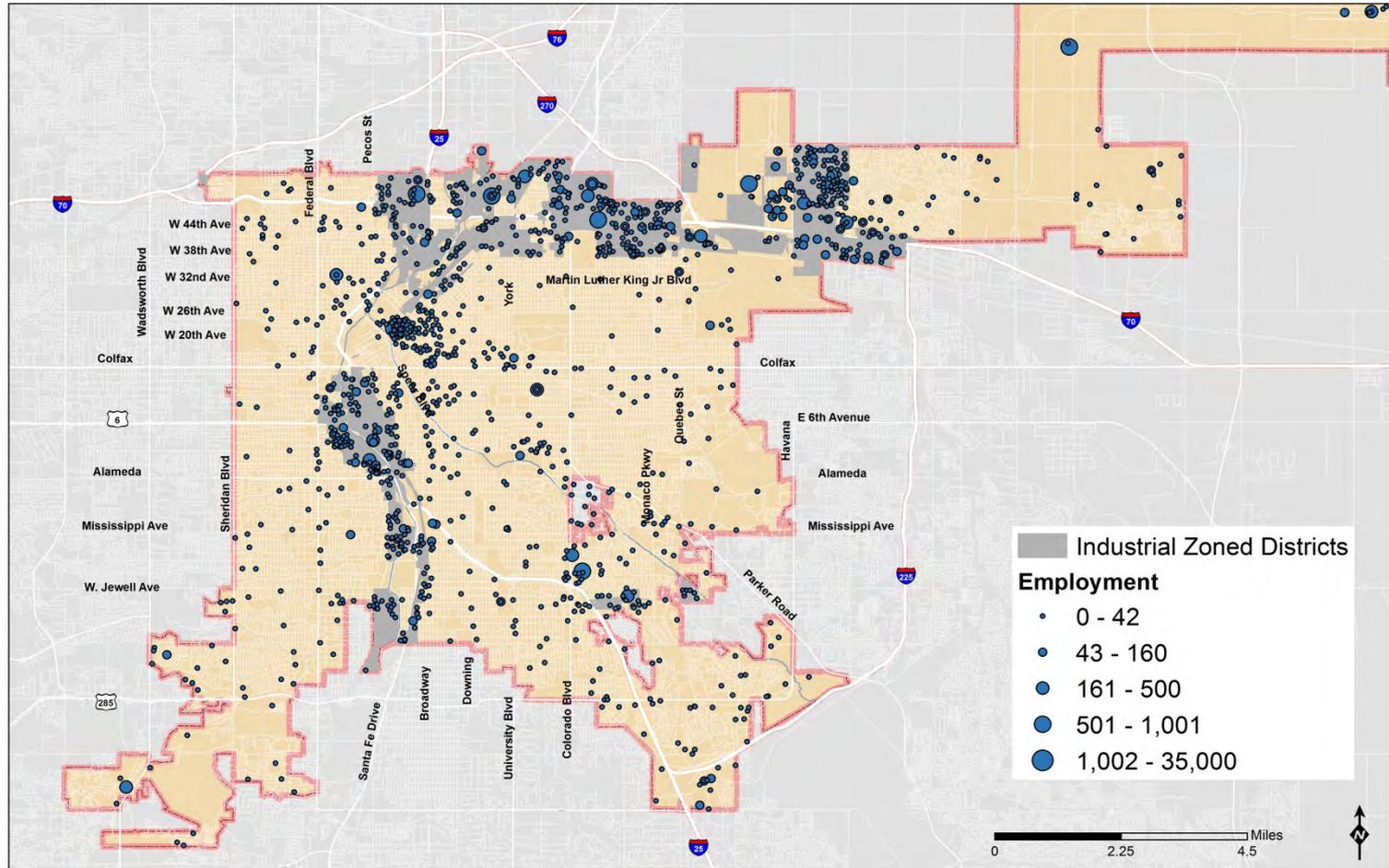
Location of Jobs - Manufacturing



Source: InfoGroup, Economic & Planning Systems
Manufacturing jobs concentrated on the I-70 and I-25 corridors in or near industrial zoned areas. **Industrial Zoned Districts** on the map are defined as I-A, I-B and I-MX zones and anything that still has the old code zoning.

Demand Analysis

Location of Jobs - Logistics

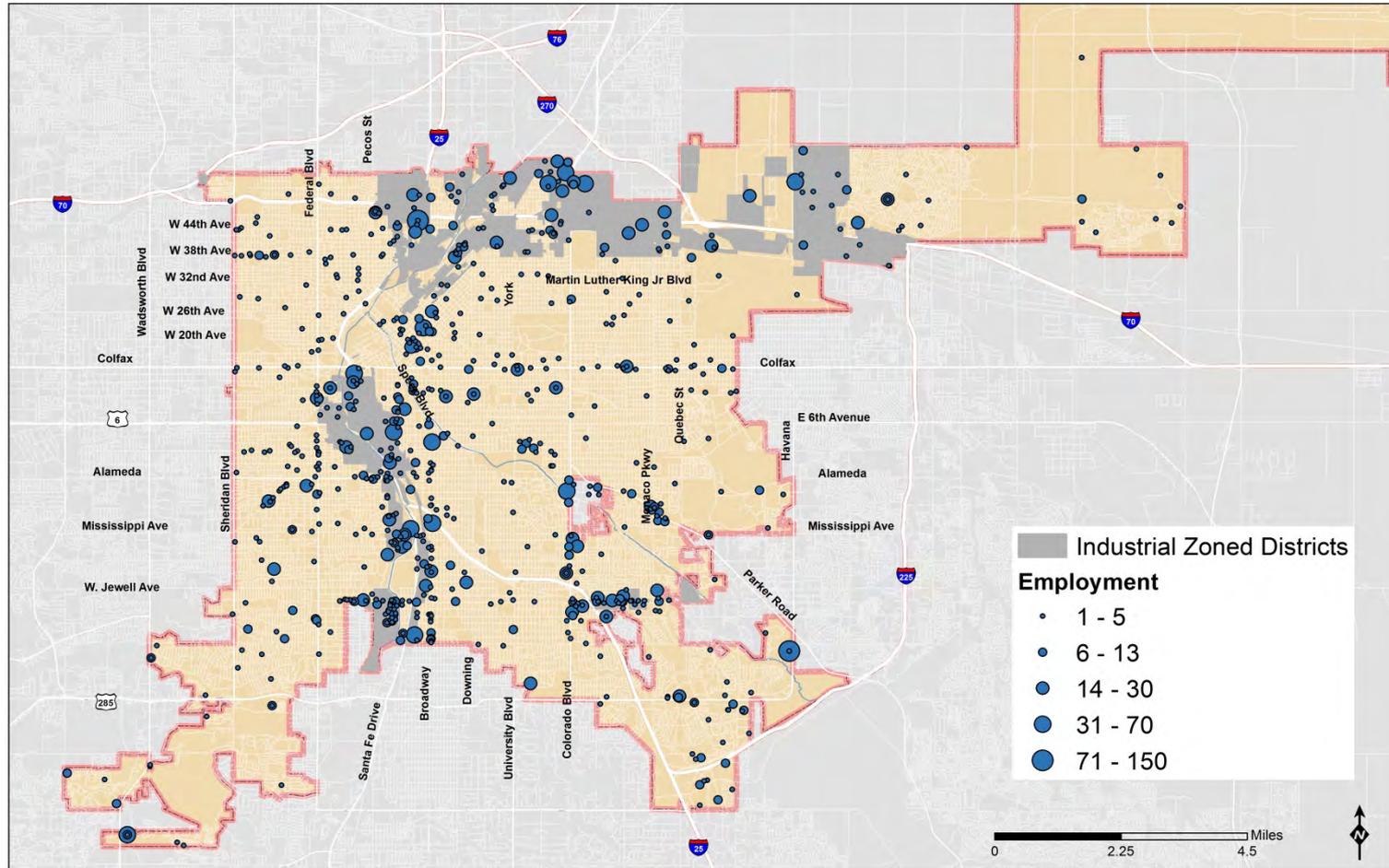


Source: InfoGroup, Economic & Planning Systems

Logistics jobs concentrated on the I-70 and I-25 corridors in or near industrial zoned areas. **Industrial Zoned Districts** on the map are defined as I-A, I-B and I-MX zones and anything that still has the old code zoning.

Demand Analysis

Location of Jobs - Services



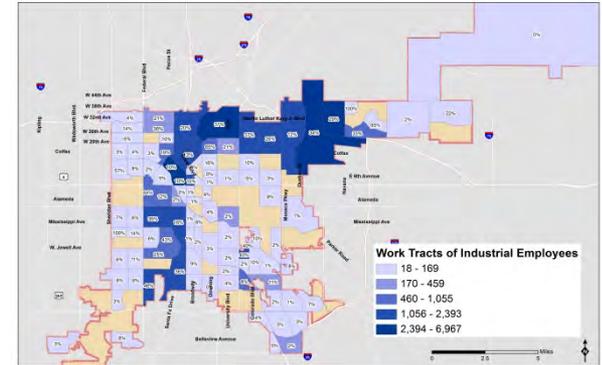
Source: InfoGroup, Economic & Planning Systems

Service jobs concentrated on the I-70 and I-25 corridors in or near industrial zoned areas. **Industrial Zoned Districts** on the map are defined as I-A, I-B and I-MX zones and anything that still has the old code zoning.

Demand Analysis

Good Producing Workers: Home and Work Locations

- The location of employment for workers employed in “Goods Producing” industries (as defined by the US Census) aligns with the location of manufacturing businesses: predominately along I-70 and I-25
- There is a strong relationship between the location of a Goods Producing worker’s job and where they live, and there is a greater concentration of households with persons employed in Goods Producing industries near Denver’s industrial areas
- Neighborhoods in North Central Denver (Globeville, Elyria-Swansea), Northeast Denver (Montbello), and Southwest Denver (Anthmar Park, Barnum West, Mar Lee, Ruby Hill, Westwood, Valverde) that are next to industrial areas have greater numbers of workers within Good Producing industries

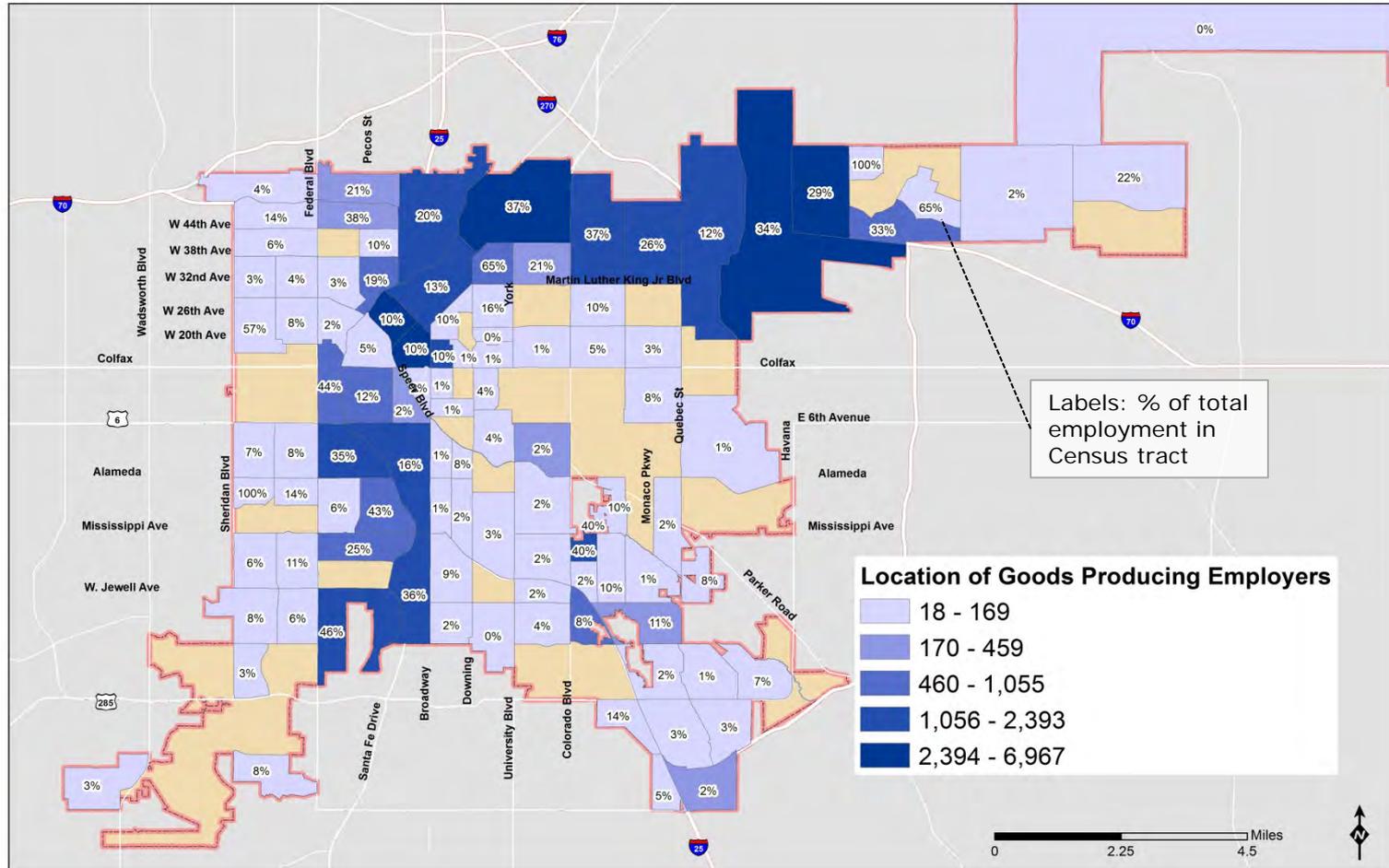


For more information see:

➤ *Following pages present maps of home and work locations of Good Producing employees, used as a proxy for industrial employees*

Demand Analysis

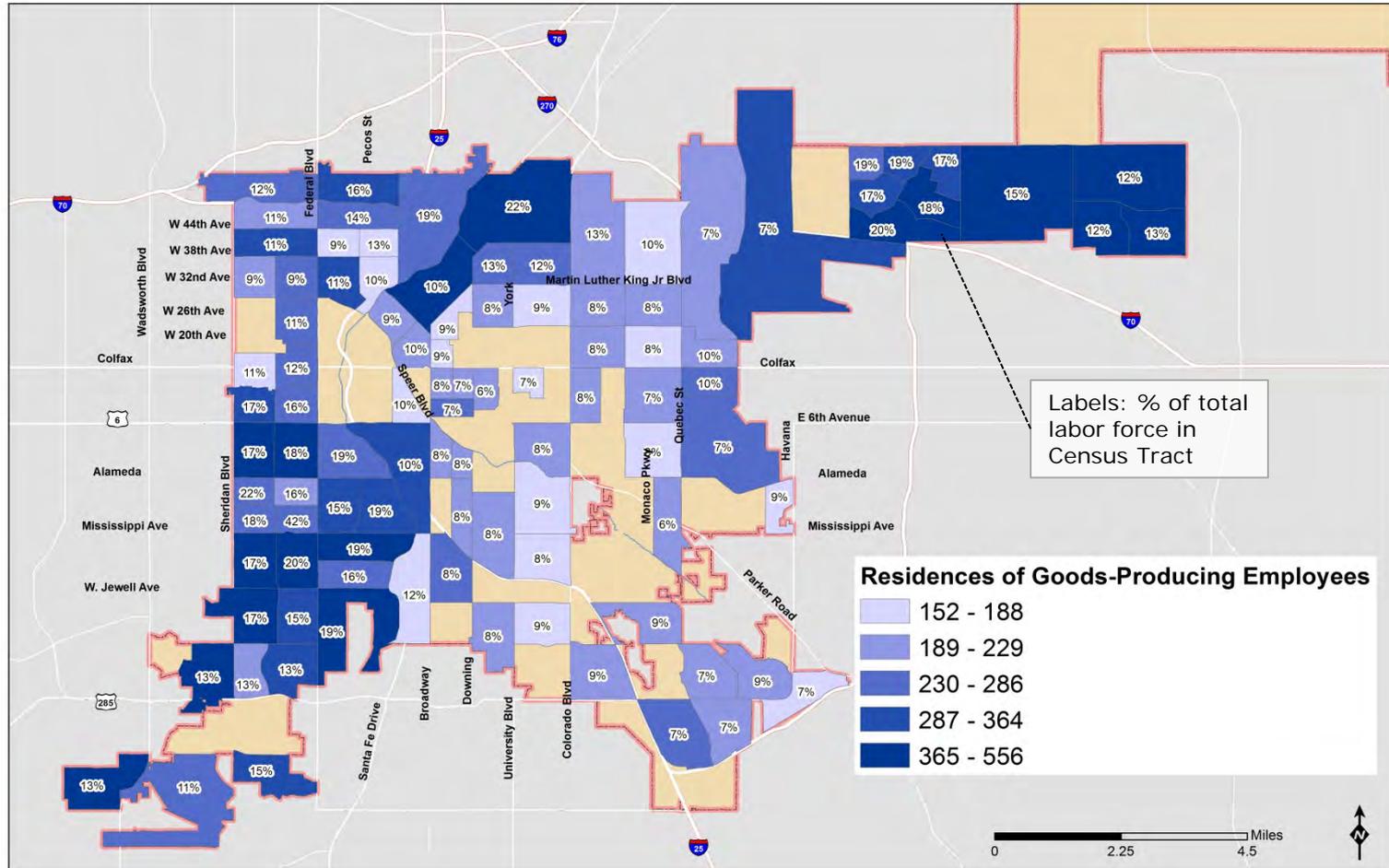
Goods Producing Workers: Location of Employment



Source: US Census LEHD, Economic & Planning Systems
 Goods Producing industries are defined as Agriculture, Mining, Construction, and Manufacturing sectors (NAICS 11, 21, 23, and 31-33 respectively).

Demand Analysis

Goods Producing Workers: Location of Home

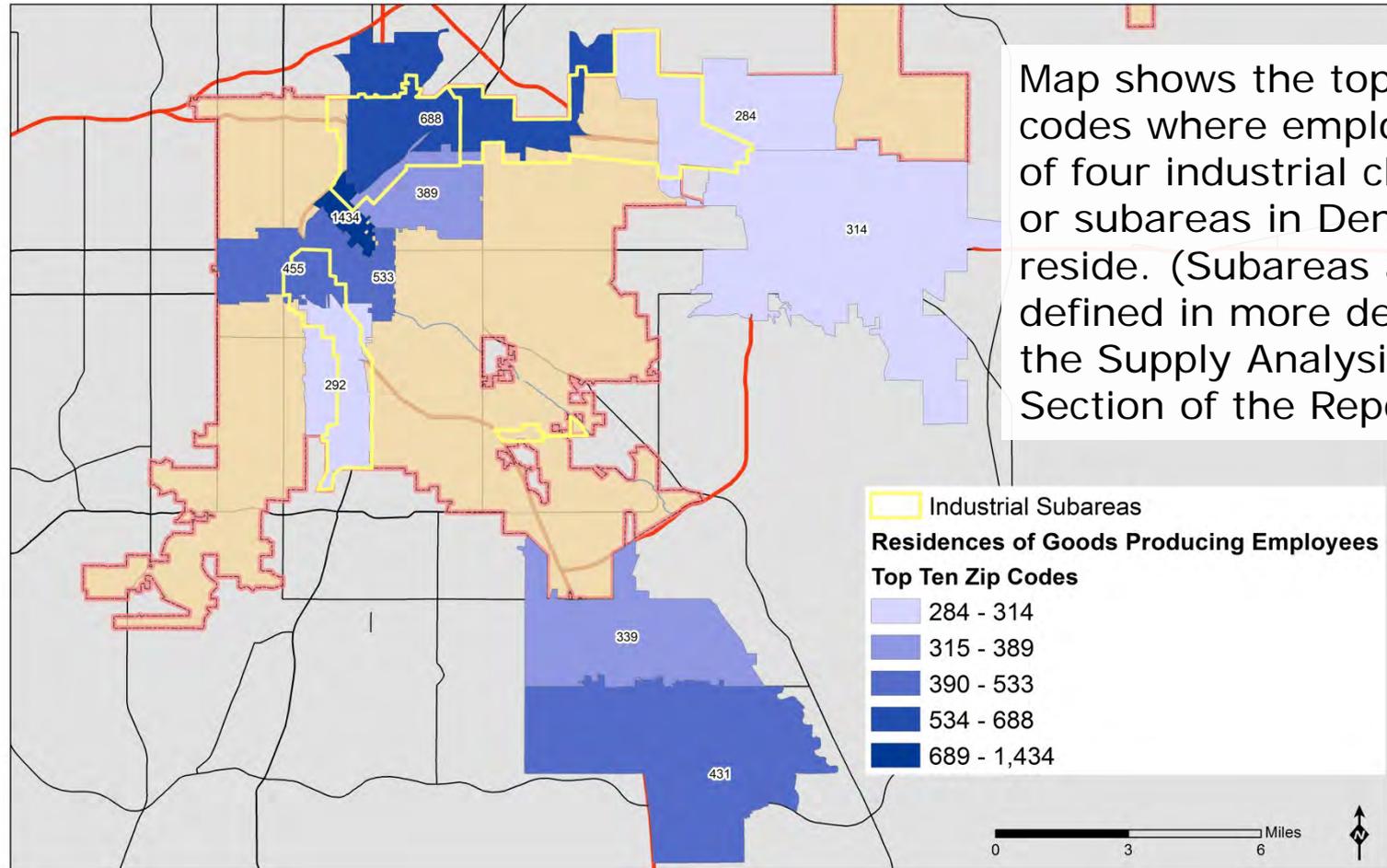


Source: US Census LEHD, Economic & Planning Systems
 Goods producing industries are defined as Agriculture, Mining, Construction, and Manufacturing sectors (NAICS 11, 21, 23, and 31-33 respectively).



Demand Analysis

Goods Producing Workers: Home Location of Denver Employees



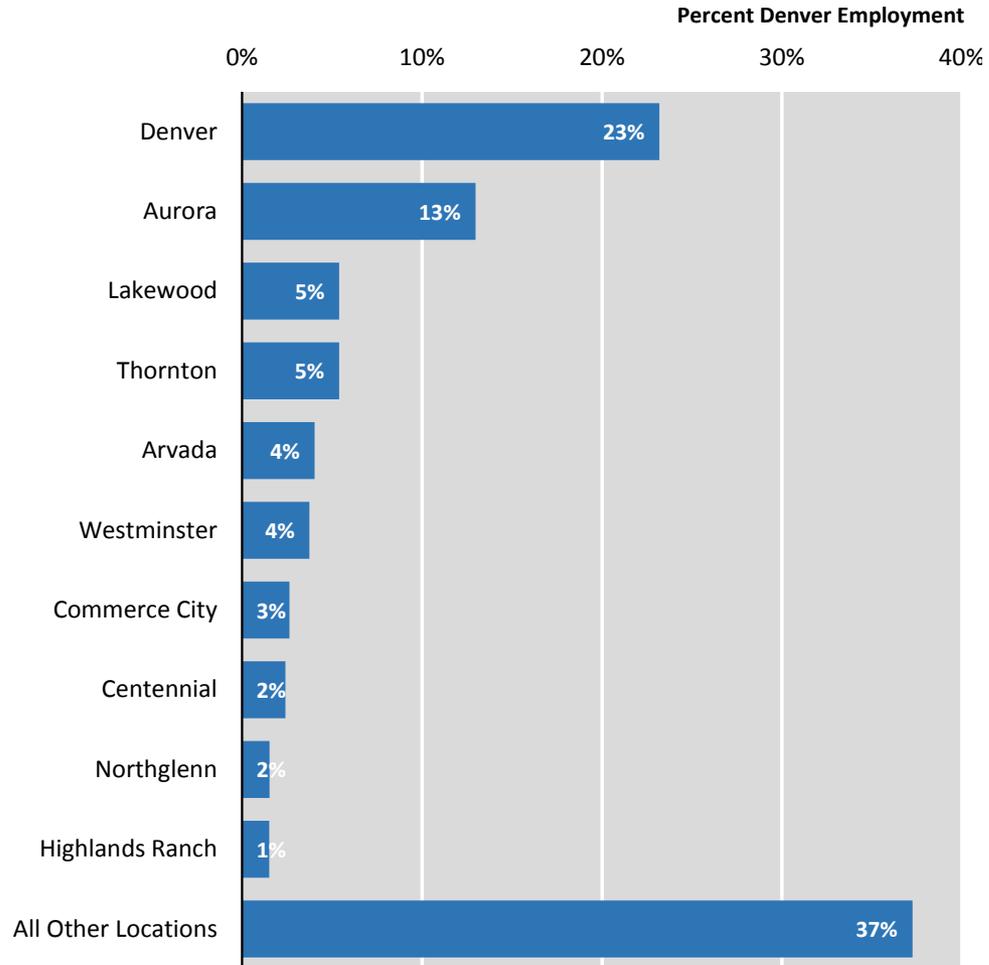
Source: US Census LEHD, Economic & Planning Systems
Goods producing industries are defined as Agriculture, Mining, Construction, and Manufacturing sectors (NAICS 11, 21, 23, and 31-33 respectively).

Demand Analysis

Home Location of Subarea Goods Producing Employees

- Of goods producing employment in the industrial subareas, 23% both live and work in Denver
- 13% of subarea workers live in Aurora, and 5% of live in Lakewood

Figure: Subarea Home Destination of Goods-Producing Employees (2014)



Source: LEHD; Economic & Planning Systems

Supply Analysis

Industrial and Flex Inventory (Square Feet)

- The industrial inventory in Denver increased by a net of 2 million square since 1999.
 - Construction of new industrial space totaled 10.8 million square feet. Annually, over a half million square feet of industrial space has been constructed in Denver since 1999
 - During the same time period, Denver lost 8.4 million square feet of industrial space since 1999, which accounted for 67% of the lost inventory in the Metro Area
- Denver accounts for 43% of the industrial space in the metro area and accounted for 26% of the new space added since 1999



Industrial/Flex space in Denver

Supply Analysis

Inventory Change

Table: Change in Industrial Inventory in Denver and Denver MSA (1999-2016)

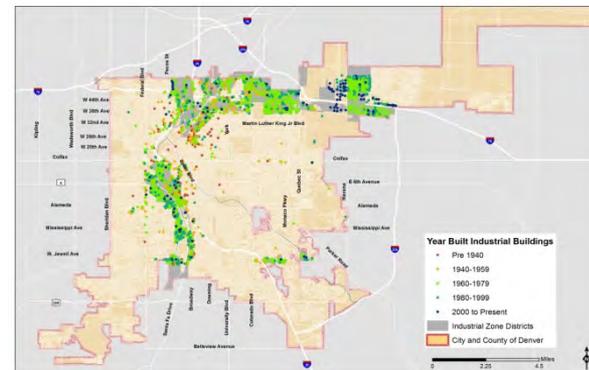
Year Built	1999	2016	Change 1999 to 2016		
			Total	Ann. #	Ann. %
City/County of Denver					
Total Inventory	94,318,812	96,322,929	2,004,117	117,889	0.1%
% of Metro Area	48%	43%	7%		
New Square Feet Constructed	348,876	163,000	10,770,280	633,546	---
% of Metro Area	40%	8%	26%		
Estimated Loss of Inventory			-8,417,287	-495,135	---
% of Metro Area			67%		
Metro Area					
Total Inventory	195,531,661	223,895,883	28,364,222	1,668,484	0.8%
New Square Feet Constructed	881,186	2,160,868	41,813,857	2,459,639	---
Estimated Loss of Inventory			-12,568,449	-739,321	---

Source: CoStar; Economic & Planning Systems

Supply Analysis

Industrial Building Deliveries and Demolitions

- The majority of new industrial space (since 2000) has been built in the northeastern portion of the city; however new buildings have been constructed in all of Denver's industrial areas since 2000
- There has been a recent trend of infill industrial development just north of Denver along I-25/Washington Street. This growth is driven by desire for businesses to be centrally located and due to businesses being displaced out of Denver
- Industrial buildings that have been demolished since 1999 primarily have been in or around downtown and the RiNo area
- The buildings being demolished are generally older (average year built of 1949) and often outmoded spaces (i.e. low ceiling heights, poor column spacing, lacking loading facilities)



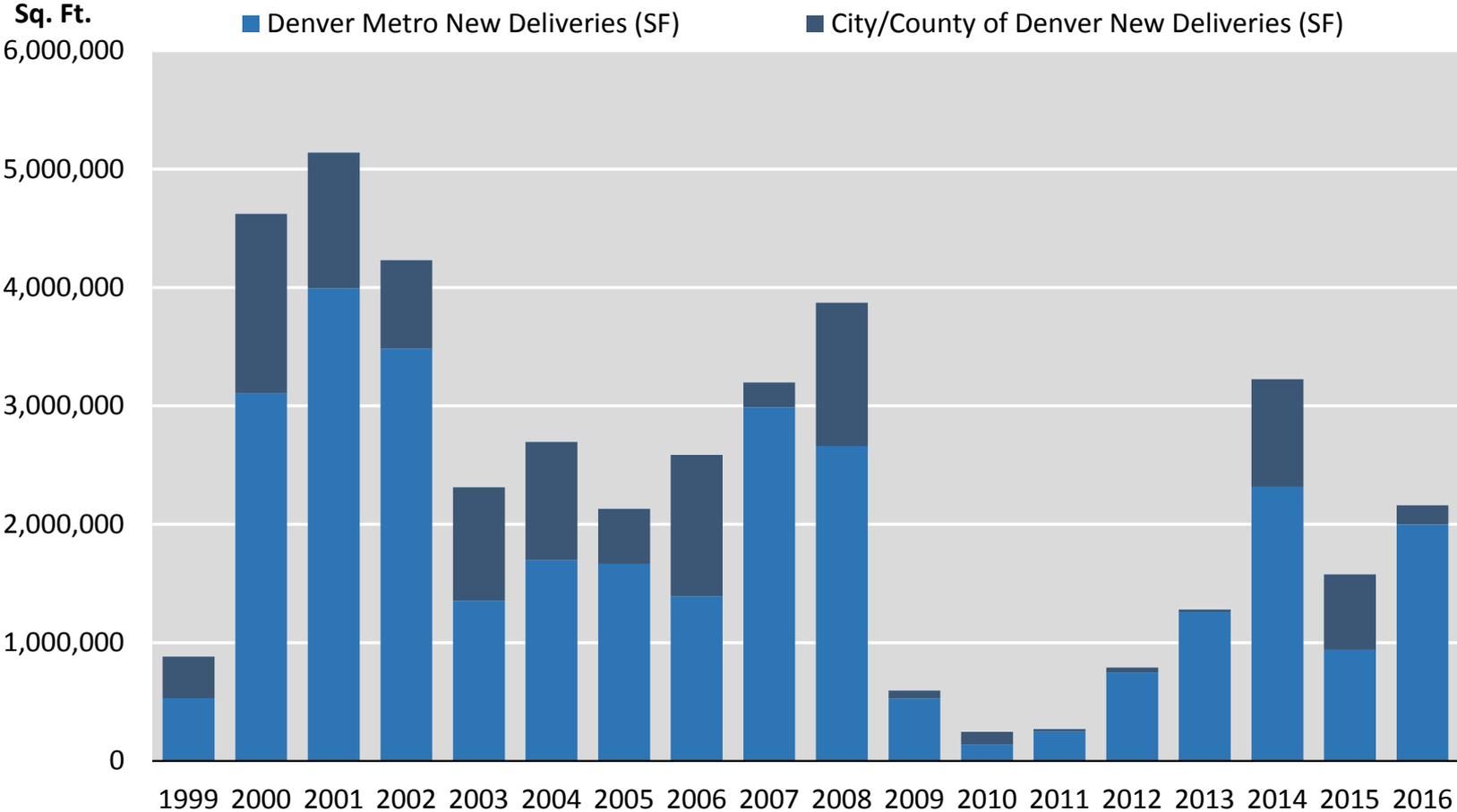
For more information see:

➤ *Following pages present maps on the year built for existing Denver inventory and the location of demolitions*

Supply Analysis

Deliveries, New Industrial Square Feet 1999 to 2016

Figure: Industrial Deliveries in Denver and Denver MSA (1999-2016)



Source: CoStar; Economic & Planning Systems

Supply Analysis

Denver Industrial Building Stock by Age

- The majority (53%) of Denver's industrial space was built between 1960 and 1979
- Older (pre 1940) industrial buildings more often found in RiNo and the downtown area only make up 3 percent of total building stock.
- The average rentable space size, parcel size, and ceiling heights have increased each decade
- New industrial spaces average over 70,000 square feet in size, which is more than double the average of all industrial spaces in the city

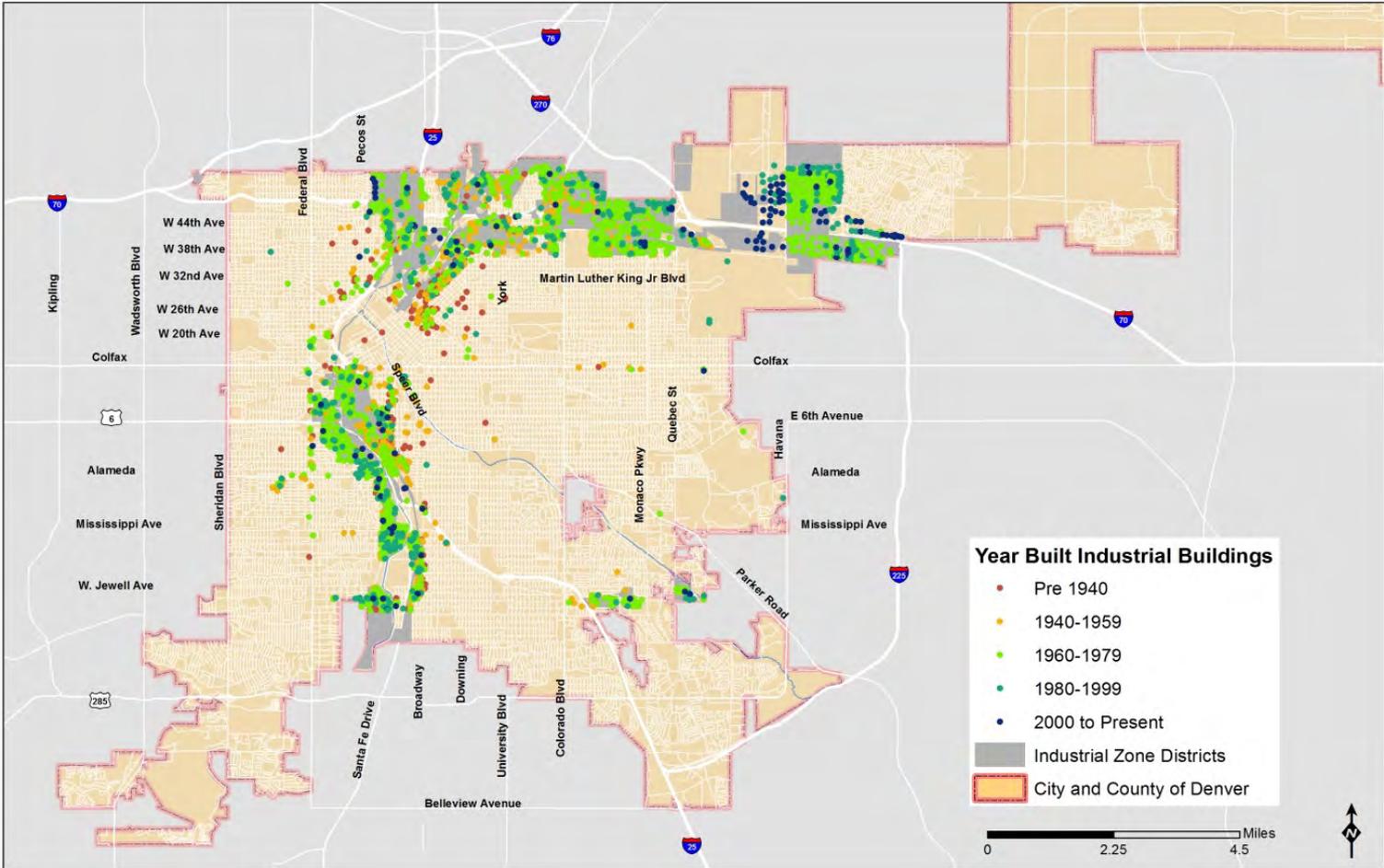
Table: Denver Industrial Building Stock

Year Built	# of Bldgs	Rentable Building Area (RBA) (Square Feet)	Average RBA (Square Feet)	Average Parcel Size (Acres)	Average Floor Area Ratio	Average Ceiling Height (Feet)
Pre 1940	232	2,996,522	12,916	0.61	0.68	16
1940 - 1959	677	14,144,979	20,894	1.42	0.48	16
1960 - 1979	1,505	45,570,297	30,279	1.83	0.49	17
1980 - 1999	444	14,118,567	31,799	2.68	0.46	19
2000 to Present	132	9,340,053	70,758	5.56	0.38	24
Average	---	---	28,820	1.93	0.49	18

Source: CoStar; Economic & Planning Systems

Supply Analysis

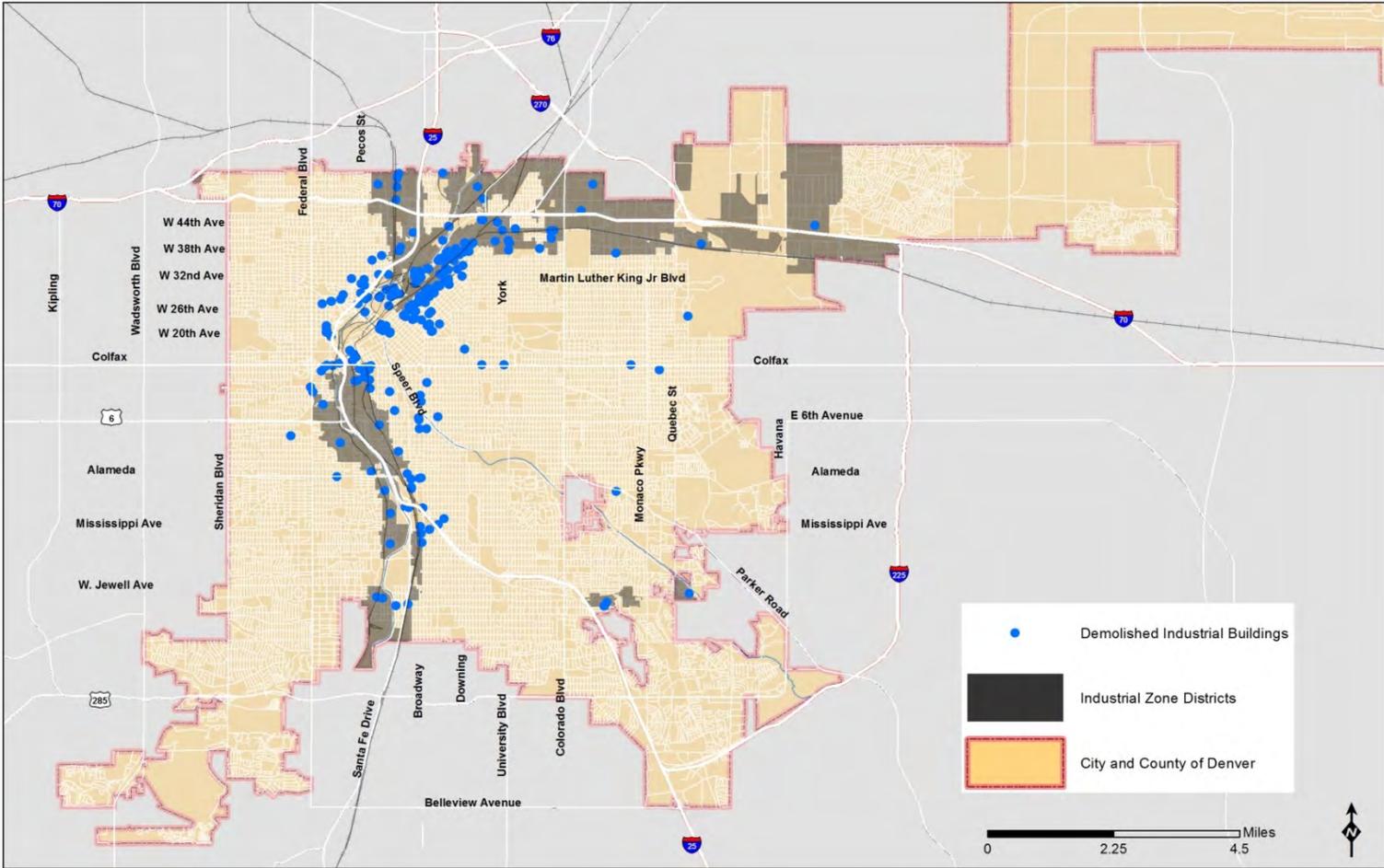
Industrial Buildings by Year Built



Source: CoStar, Economic & Planning Systems

Supply Analysis

Industrial Building Demolitions (1999 to 2016)



Source: CoStar, Economic & Planning Systems

Supply Analysis

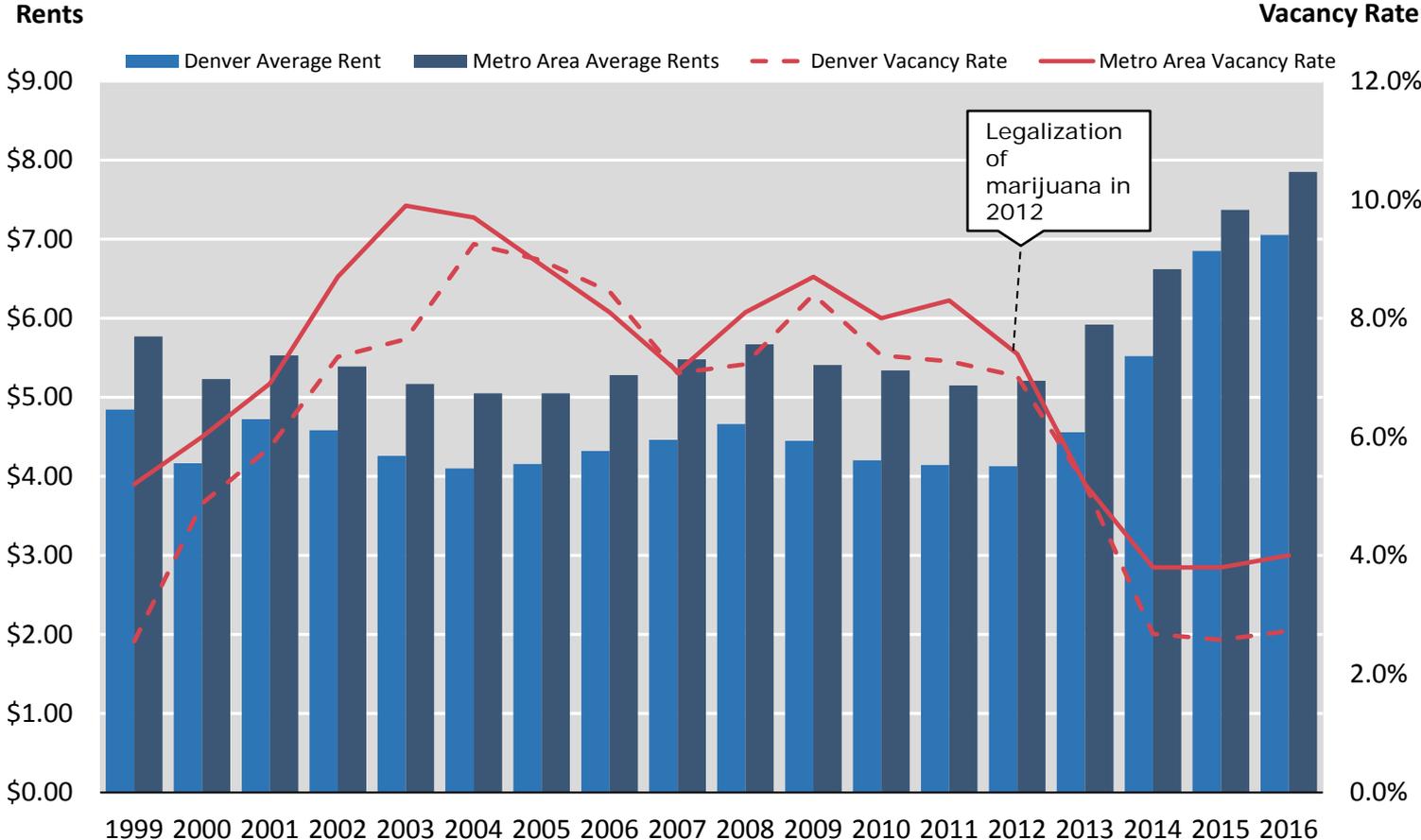
Rents and Vacancy

- The average rental rate for industrial space in Denver is \$7.06 per square foot (NNN), which is slightly lower than the Metro Area average of \$7.86 per square foot
- The vacancy rate for Denver at the end of 2016 was 2.7 percent, which was lower than the Metro Average of 4.0 percent
- Rental rates in Denver and the Metro Area have increased by over \$2.50 per square foot since 2012. Average rates in Denver have increased in Denver by 71 percent since 2012
- Vacancy rates have dropped substantially in Denver and Metro Area since 2012. The vacancy rate in Denver was 7.0 percent in 2012
- The market for industrial space in Denver and Metro Area is very tight with rates and vacancy indicating strong demand

Supply Analysis

Rents and Vacancy

Figure: Industrial Rents and Vacancy Rates in Denver and Denver MSA

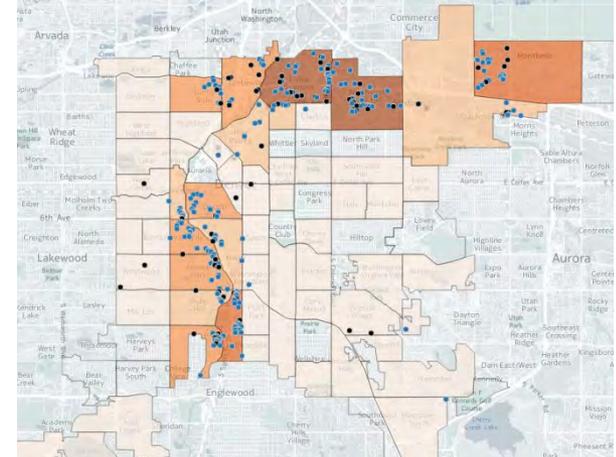


Source: CoStar; Economic & Planning Systems

Supply Analysis

Impact of Marijuana

- The legalization of retail marijuana in 2012 has impacted the industrial market in Denver. Brokers estimate marijuana uses account for about 2 percent of the industrial space in the MSA
- The significant decreases in vacancy and increases in rental rates are largely attributed to marijuana, although there is a growing demand in general for industrial space
- Lower quality Class B and C space has been largely occupied by marijuana users. The effect has been a decrease in vacancy due to marginal spaces being leased and increase in rent rates as lower cost spaces are occupied by marijuana facilities
- The biggest impact of marijuana from industrial space availability perspective has been on smaller businesses needing smaller spaces. Larger users are not competing for the same spaces



Location of Marijuana cultivation and manufacturing facilities

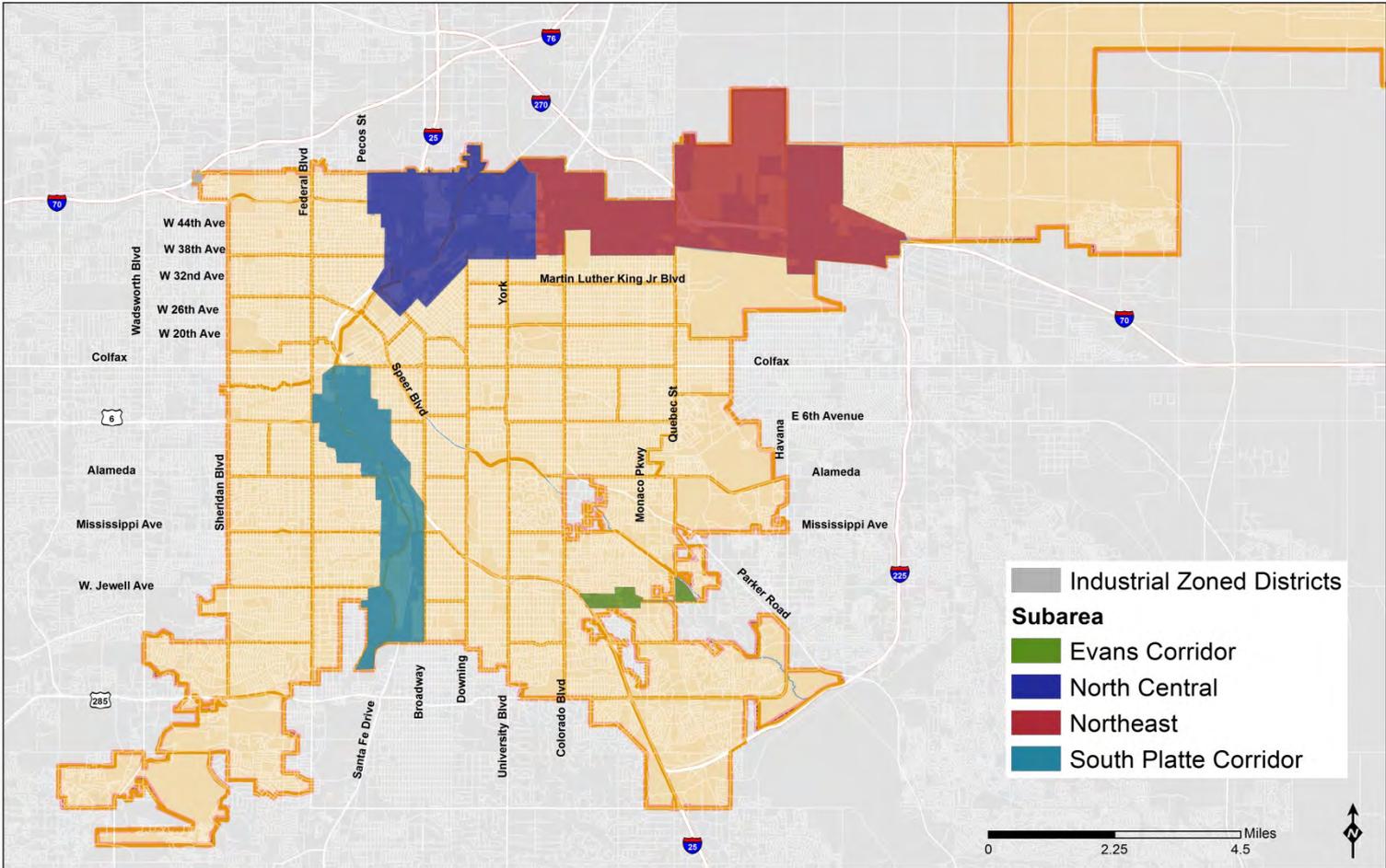


For more information see:

➤ Kevin Hamm, "Marijuana in Denver," Denver Post Online, 2016

Supply Analysis

Industrial Subareas



Source: Economic & Planning Systems

Supply Analysis

Location Relative to Subareas

- While only 39% of firms are located in the industrial subareas, 70% of large firms are located in these clusters
- Industrial subareas also account for 62% of industrial sales

Description	All Denver		Subareas		
	Count	% Total	Count	% Subareas	% Total
ESTABLISHMENTS					
All Firms					
Manufacturing	1,140	20%	644	28%	56%
Logistics	1,870	33%	962	42%	51%
Services	<u>2,734</u>	<u>48%</u>	<u>661</u>	<u>29%</u>	<u>24%</u>
Subtotal	5,744	100%	2,267	100%	39%
Large Firms [1]					
Manufacturing	197	3%	155	7%	79%
Logistics	250	4%	178	8%	71%
Services	<u>180</u>	<u>3%</u>	<u>106</u>	<u>5%</u>	<u>59%</u>
Subtotal	627	11%	439	19%	70%
EMPLOYMENT					
Manufacturing	22,192	19%	14,233	32%	64%
Logistics	68,241	59%	20,442	46%	30%
Services	<u>26,117</u>	<u>22%</u>	<u>10,229</u>	<u>23%</u>	<u>39%</u>
Subtotal	116,550	100%	44,904	100%	39%
SALES (000s) [2]					
Manufacturing	\$5,821,748	15%	\$3,213,164	13%	55%
Logistics	\$26,999,036	69%	\$18,909,290	77%	70%
Services	<u>\$6,572,403</u>	<u>17%</u>	<u>\$2,394,723</u>	<u>10%</u>	<u>36%</u>
Subtotal	\$39,393,187	100%	\$24,517,177	100%	62%

[1] Larger than 20 employees (i.e. larger than a SUM)

[2] A modeled figure derived from employment size and other factors to indicate the sales volume of the business.

Source: InfoGroup; Economic & Planning Systems

Supply Analysis

North Central – Character



Kasel Associate Industries services refrigeration and boiler needs. Neighbors have complained about noxious odors from the industrial use.



Many industrial buildings are just corrugated metal boxes that allow for flexible uses, but don't necessary add to the "character" of a neighborhood.



This industrial building was converted to artist studios and upscale lofts. Similar to industrial uses, artists are very sensitive to marginal increase in rent



Industrial building in RiNo. Building like theses have large floorplate, allowing for a variety of different uses from advanced manufacturing to office



Ratio converted an industrial building into a brewery. Brewery are classified as food and beverage manufacturing in this study.



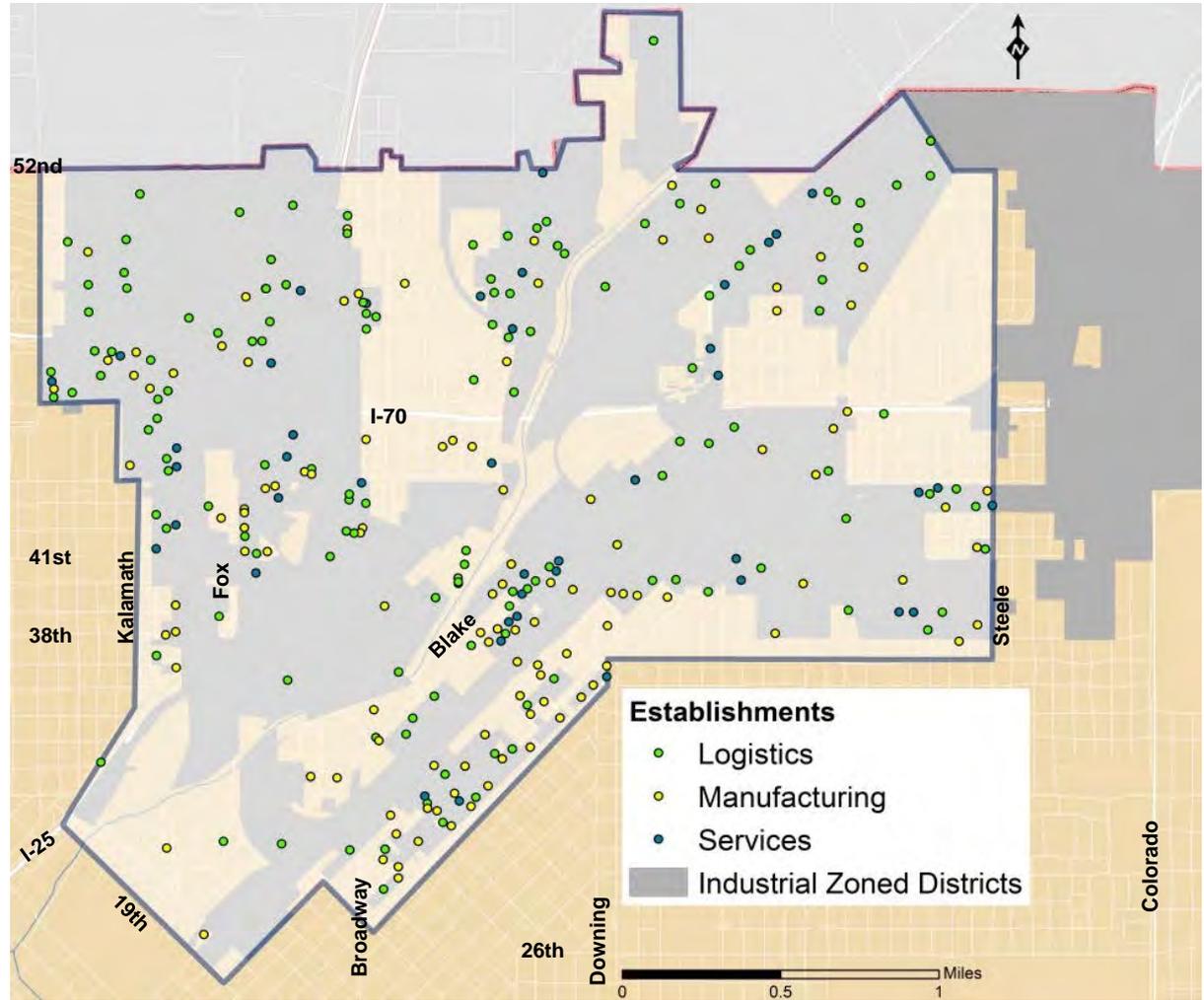
Manufacturing buildings are also being converted to office space, including the Green Spaces coworking facility shown above.

Supply Analysis

North Central – Industrial Firms

Description	Value	Percent
Building Info		
		<i>% Total</i>
Number of Buildings	626	21%
RBA (sq. ft.)	16,225,550	19%
RBA since 1999 (sq. ft.)	847,655	8%
Average RBA (sq. ft.)	25,919	---
Average Year Built	1959	---
Establishments		
		<i>% Subtotal</i>
SUMs	429	84%
Large Firms	<u>80</u>	<u>16%</u>
Subtotal	509	100%
Employment		
		<i>% Subtotal</i>
Manufacturing	3,632	38%
Logistics	4,386	45%
Services	<u>1,648</u>	<u>17%</u>
Subtotal	9,666	100%
Sales (\$000s)		
		<i>% Subtotal</i>
Manufacturing	1,055,887	22%
Logistics	3,350,079	70%
Services	<u>353,867</u>	<u>7%</u>
Subtotal	4,759,833	100%

Source: CoStar; InfoGroup; Economic & Planning Systems



Source: InfoGroup, Economic & Planning Systems

Supply Analysis

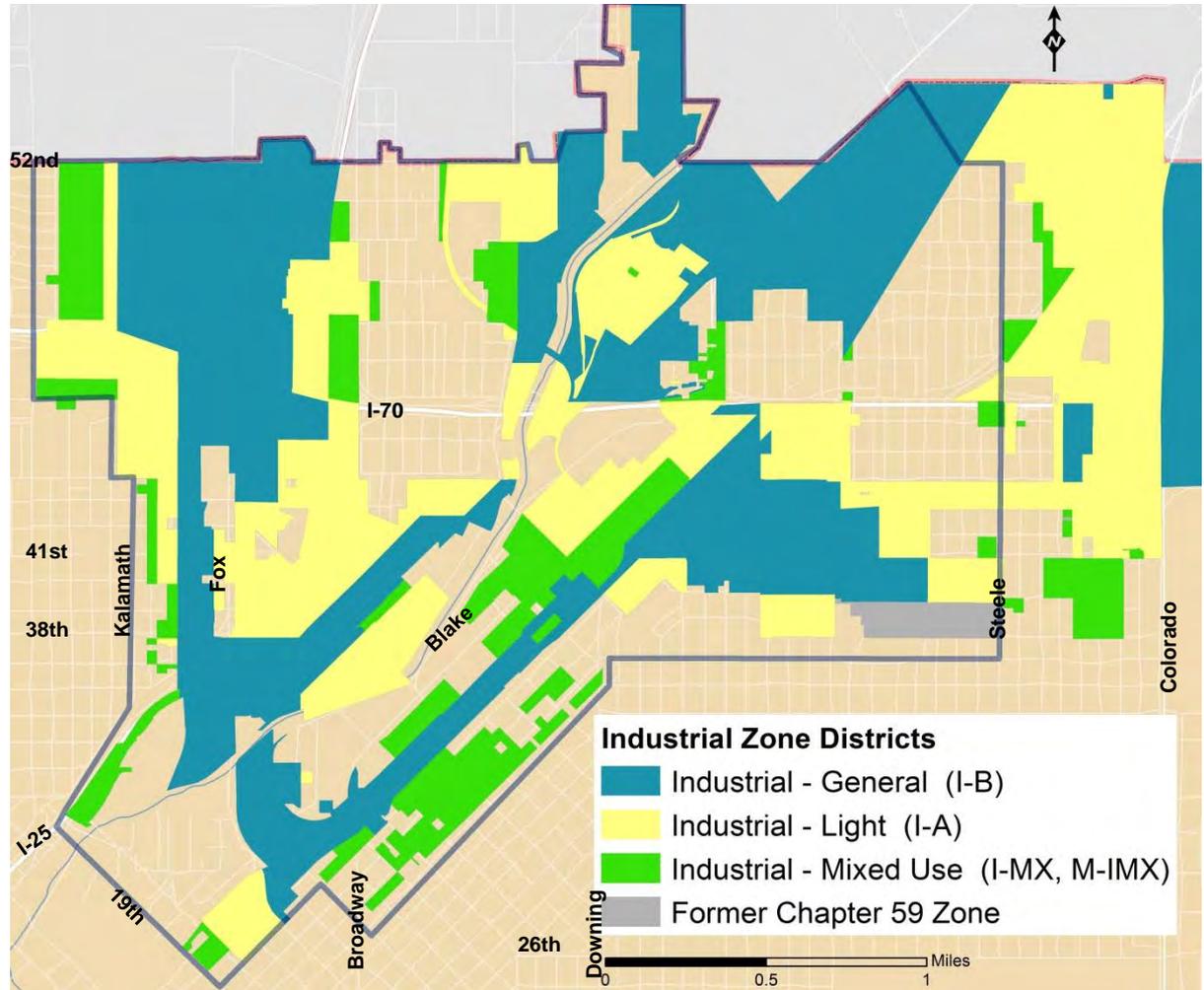
North Central – Zoning

Zoning	Acres	% Total
Industrial - Light (I-A)	750	32%
Industrial - General (I-B)	1,235	53%
Industrial - Mixed Use (I-MX, M-IMX)	322	14%
Former Chapter 59 Zone	<u>32</u>	<u>1%</u>
Total	2,339	100%

Source: Economic & Planning Systems

Industrial Zones	Firms in Industrial Zones	% All Firms in Subarea
Manufacturing	105	74%
Logistics	168	77%
Services	<u>95</u>	<u>63%</u>
Subtotal	368	72%

Source: InfoGroup; Economic & Planning Systems

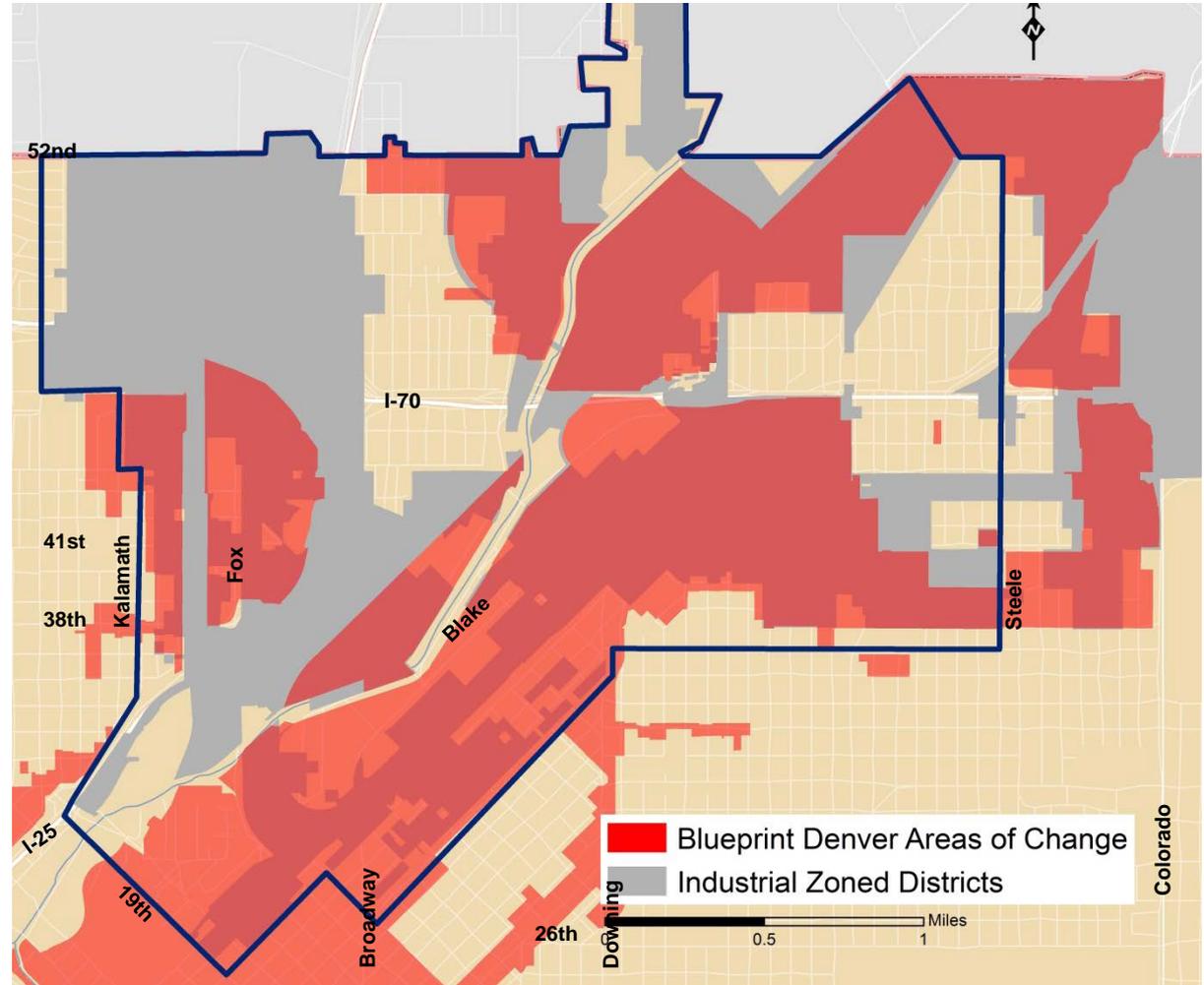


Source: City and County of Denver, Economic & Planning Systems

Supply Analysis

North Central – Areas of Change

- There are 1,822 acres of land designated as AOC in the subarea. This represents 9% of the total AOC in the City
- Of the AOC designated land, 1,329 acres or 57% of the industrial zoned areas are designated as AOC

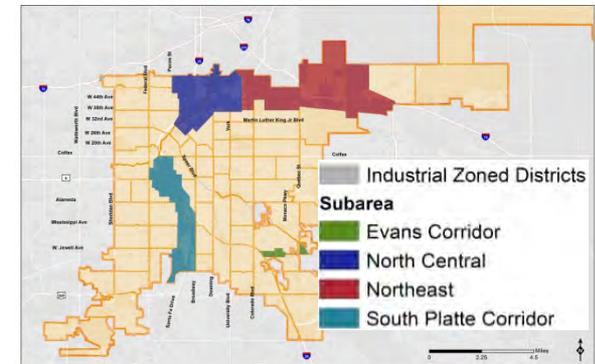


Source: City and County of Denver, Economic & Planning Systems

Supply Analysis

Northeast – Overview

- The Northeast subarea is a key logistics node in the City with a total of 441 logistics firms and approximately 11,300 employees
- Its proximity to the interstate system as well as to DIA make this an attractive location for logistics, and 24% of all logistics firms in the City are located here
- In addition to logistics, there are 224 manufacturing firms and approximately 5,400 manufacturing workers, which represent 25% of all manufacturing employment in the City
- The Northeast has larger average building sizes than other industrial subareas. This is partly attributable to the prominence of logistics space and, relatedly, to newer building stock. The average rentable building area is 50,000 sq. ft. in the Northeast, compared to 25,000 sq. ft. in North Central and 20,000 sq. ft. in the South Platte Corridor



Supply Analysis

Northeast – Character



Logistics facilities located along I-70. These logistics facilities are just simple boxes with open floor plans, large floorplates, and loading bays with easy access to interstates.

Other examples of logistics facilities located near I-70 in Denver.

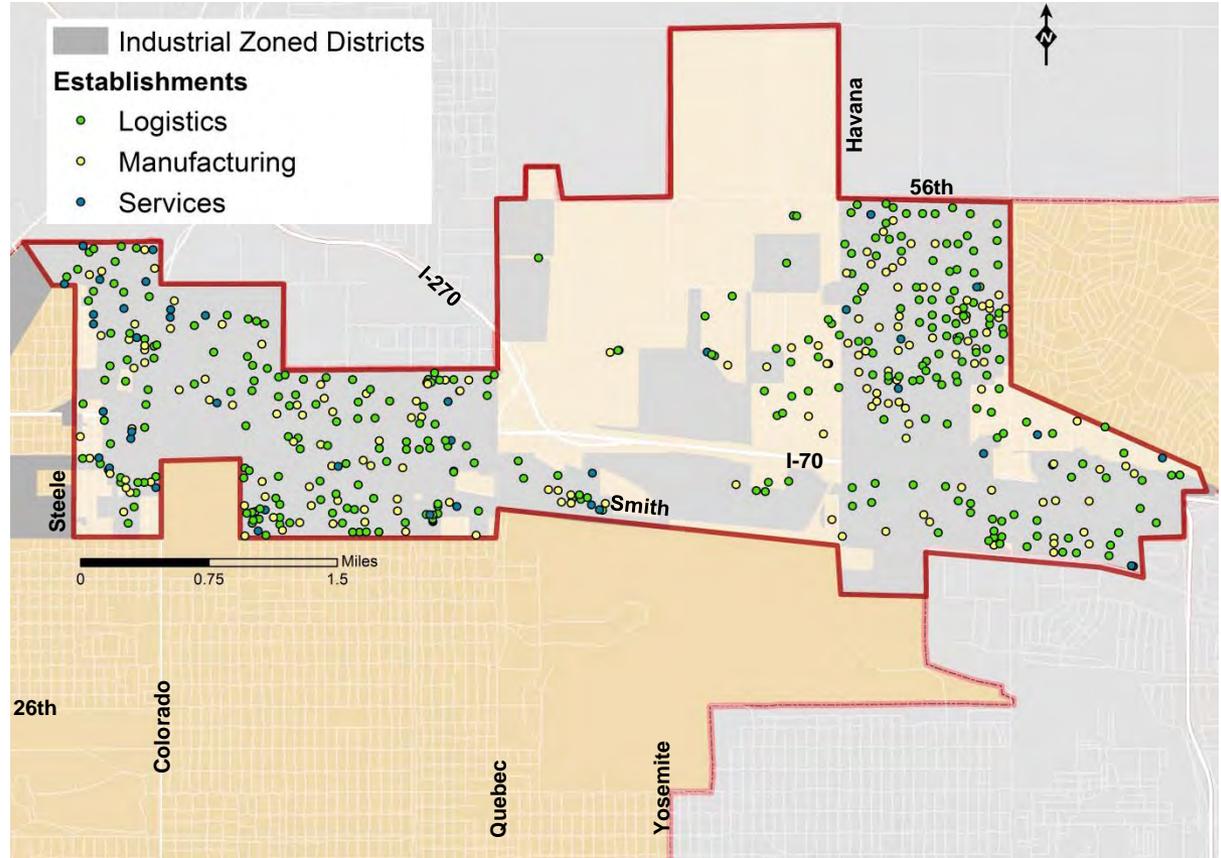
Intertech Plastics is located in a non-descript one-story building near the I-70 corridor. The company is an advanced manufacturer founded in Denver in 1980 as a custom injection molded plastic product, eventually growing to a diverse line of products and design and engineering support.

Supply Analysis

Northeast – Industrial Firms

Description	Value	Percent
Building Info		
		<i>% Total</i>
Number of Buildings	933	31%
RBA (sq. ft.)	46,541,804	54%
RBA since 1999 (sq. ft.)	8,776,988	86%
Average RBA (sq. ft.)	49,884	---
Average Year Built	1974	---
Establishments		
		<i>% Subtotal</i>
SUMs	631	75%
Large Firms	<u>209</u>	<u>25%</u>
Subtotal	840	100%
Employment		
		<i>% Subtotal</i>
Manufacturing	5,432	27%
Logistics	11,272	57%
Services	<u>3,146</u>	<u>16%</u>
Subtotal	19,850	100%
Sales (\$000s)		
		<i>% Subtotal</i>
Manufacturing	1,051,284	9%
Logistics	9,749,361	85%
Services	<u>648,087</u>	<u>6%</u>
Subtotal	11,448,732	100%

Source: CoStar; InfoGroup; Economic & Planning Systems



Source: InfoGroup, Economic & Planning Systems

Supply Analysis

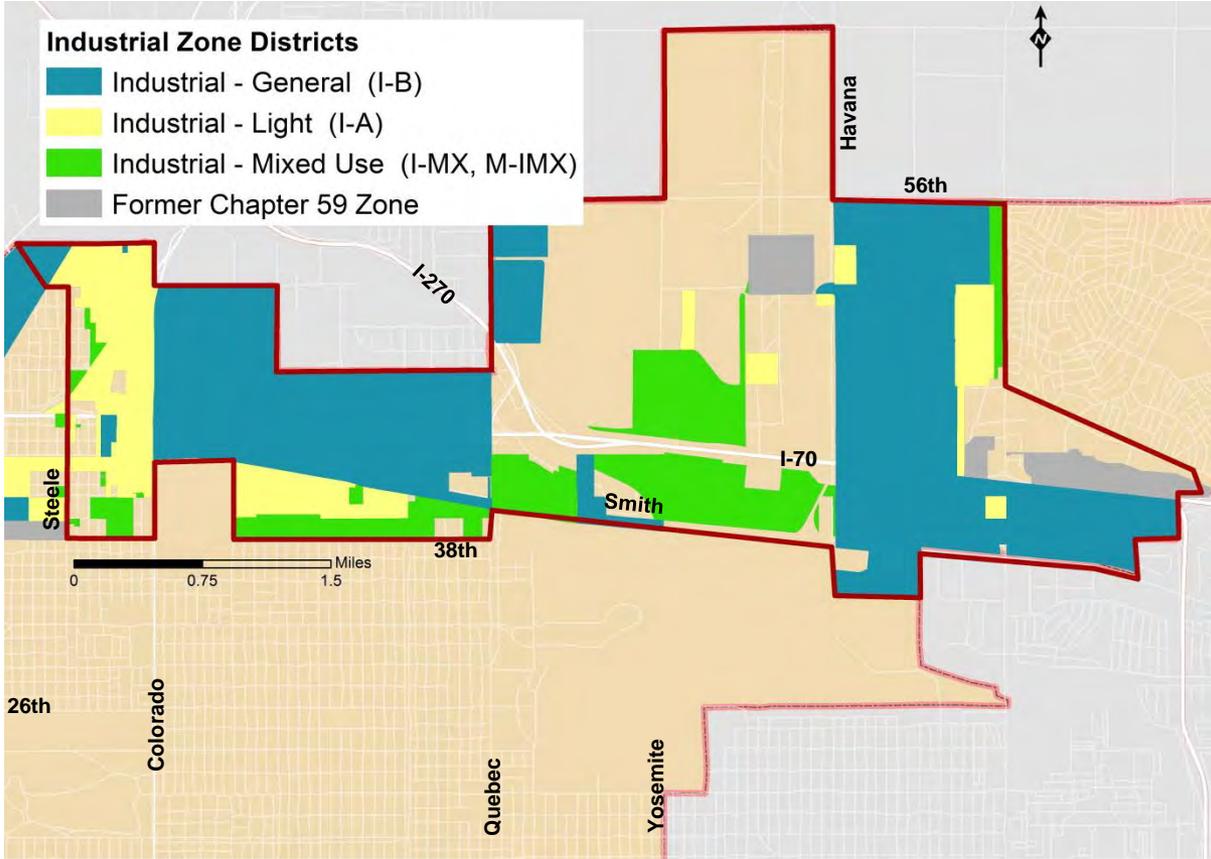
Northeast – Zoning

Zoning	Acres	% Total
Industrial - Light (I-A)	796	16%
Industrial - General (I-B)	2,963	61%
Industrial - Mixed Use (I-MX, M-IMX)	827	17%
Former Chapter 59 Zone	<u>251</u>	<u>5%</u>
Total	4,837	100%

Source: Economic & Planning Systems

Industrial Zones	Firms in Industrial Zones	% All Firms in Subarea
Manufacturing	105	74%
Logistics	168	77%
Services	95	63%
Subtotal	368	72%

Source: InfoGroup; Economic & Planning Systems

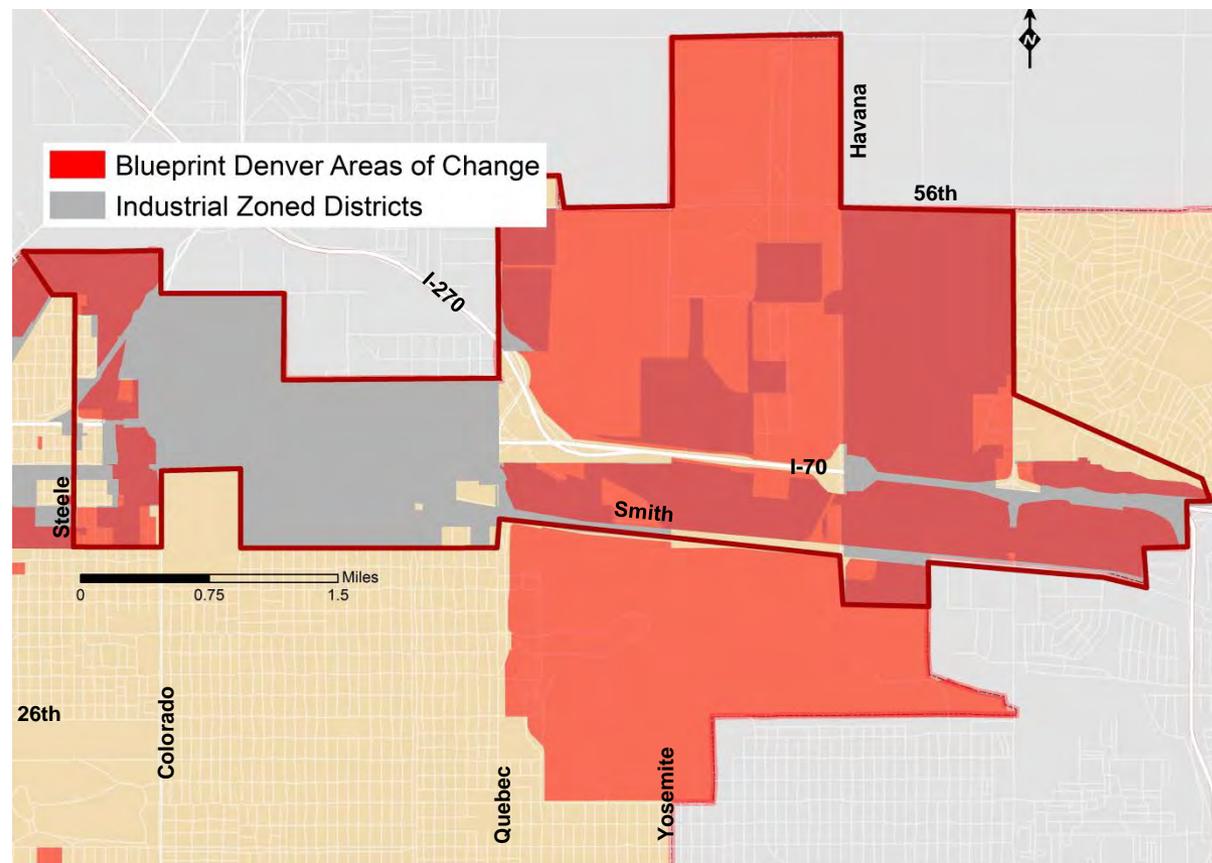


Source: City and County of Denver, Economic & Planning Systems

Supply Analysis

Northeast – Areas of Change

- There are 4,759 acres of land designated as AOC in the subarea. This represents 23% of the total AOC in the City
- Of the AOC designated land, 2,662 acres or 55% of the industrial zoned areas are designated as AOC

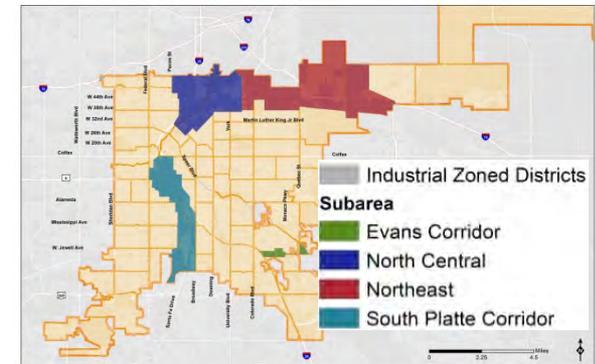


Source: City and County of Denver, Economic & Planning Systems

Supply Analysis

South Platte Corridor – Overview

- The South Platte Corridor has a relatively even mix of Manufacturing (212), Logistics (228), and Services (251) firms
- In comparison to the other industrial subareas, this corridor has a high concentration of Services, which tend not to be as clustered in industrial zones as the other industrial categories. Approximately 20% of Services employment throughout the City are located in this corridor
- The corridor also accounts for approximately 20% of the Manufacturing employees in the City
- Like the North Central and Northeast, the subarea has good access to the interstate system and to rail transportation
- The subarea has an older building stock than the Northeast, with only 4% of the RBA built after 1999, compared to 86% in the Northeast



Supply Analysis

South Platte Corridor – Character



Overhead view of manufacturing facilities located on the I-25 corridor. Artemis Vision, shown in the bottom picture, is an example of an advanced manufacturing firm that creates machine vision solutions for other industries.



Denver Rubber Company created custom rubber products for industrial and fabrication organizations.



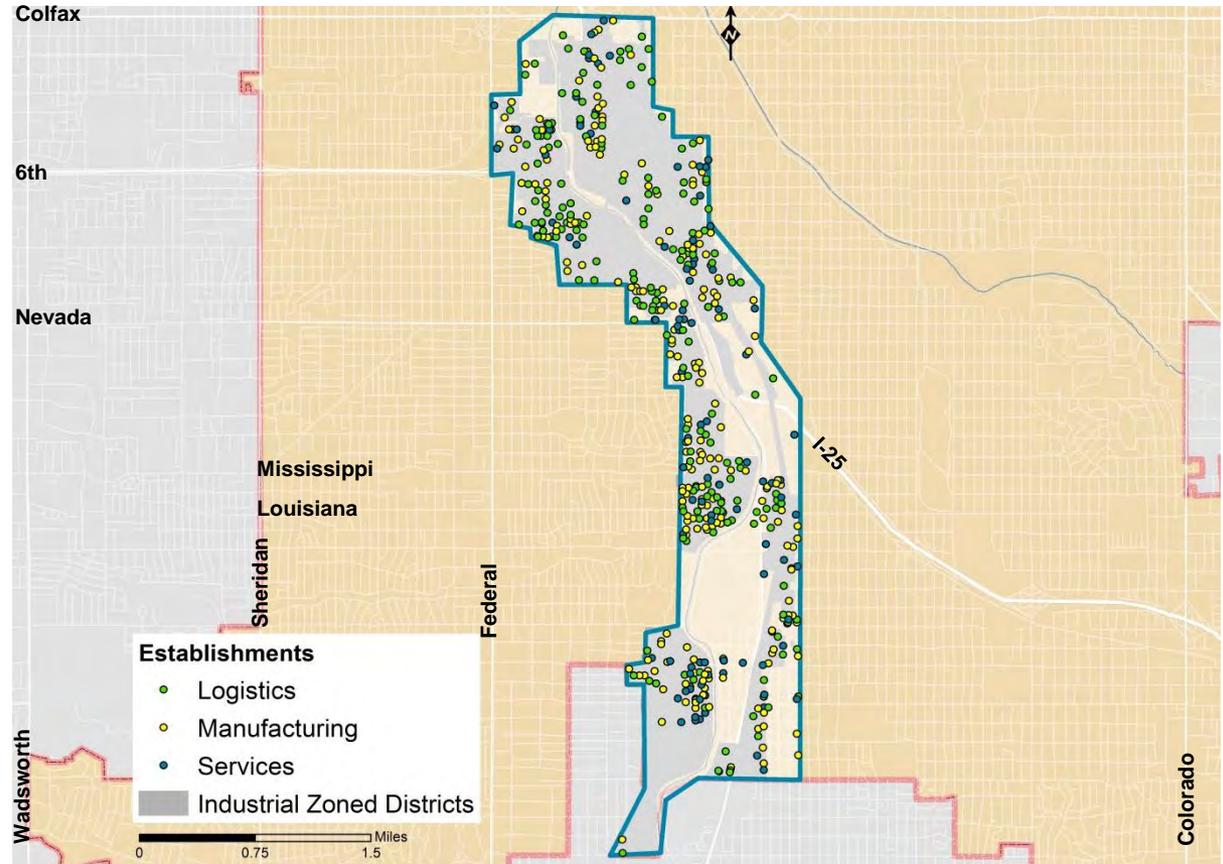
Other examples of industrial space in the South Platte Corridor.

Supply Analysis

South Platte Corridor – Industrial Firms

Description	Value	Percent
Building Info		
		<i>% Total</i>
Number of Buildings	1,052	35%
RBA (sq. ft.)	18,749,006	22%
RBA since 1999 (sq. ft.)	421,416	4%
Average RBA (sq. ft.)	17,822	---
Average Year Built	1964	---
Establishments		
		<i>% Subtotal</i>
SUMs	691	83%
Large Firms	143	17%
Subtotal	834	100%
Employment		
		<i>% Subtotal</i>
Manufacturing	4,530	33%
Logistics	4,324	31%
Services	5,047	36%
Subtotal	13,901	100%
Sales (\$000s)		
		<i>% Subtotal</i>
Manufacturing	1,048,328	13%
Logistics	5,528,261	70%
Services	1,319,707	17%
Subtotal	7,896,296	100%

Source: CoStar; InfoGroup; Economic & Planning Systems



Source: InfoGroup, Economic & Planning Systems

Supply Analysis

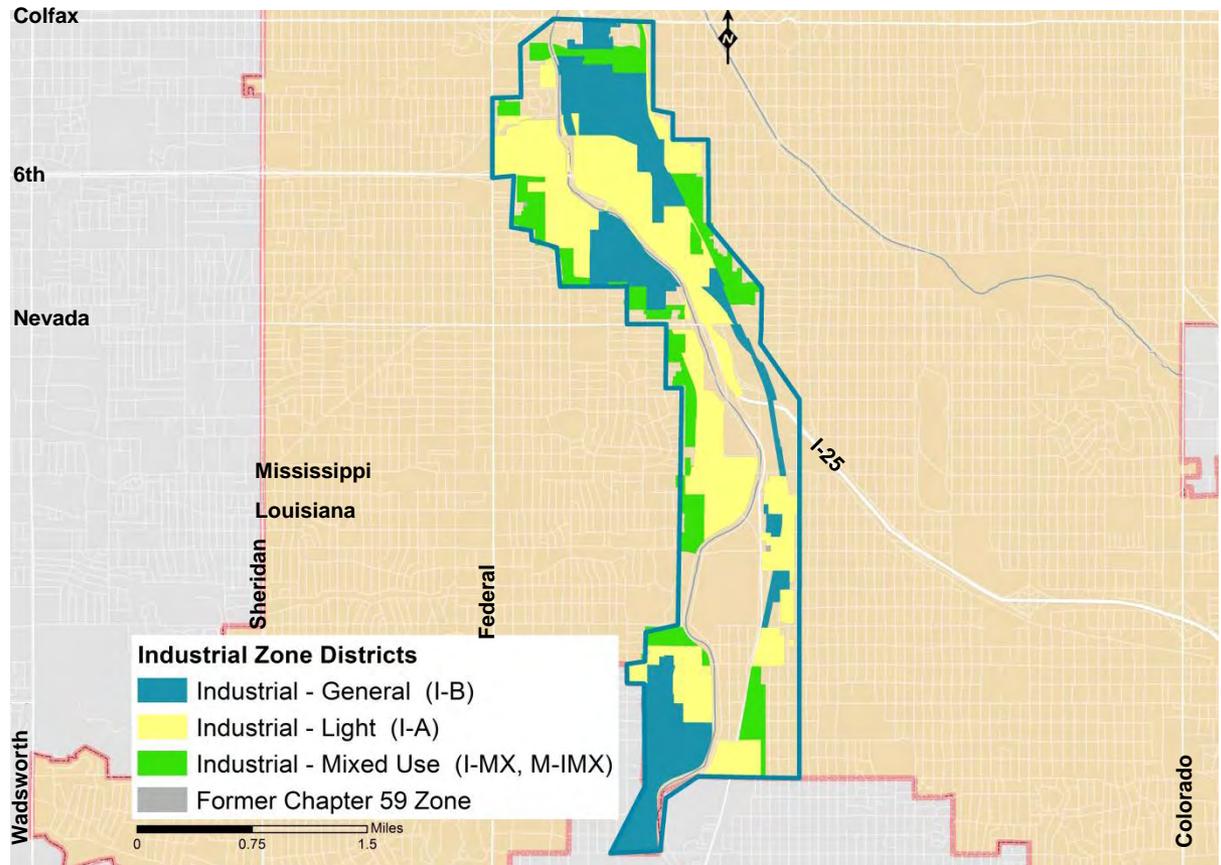
South Platte Corridor – Zoning

Zoning	Acres	% Total
Industrial - Light (I-A)	987	49%
Industrial - General (I-B)	653	32%
Industrial - Mixed Use (I-MX, M-IMX)	381	19%
Former Chapter 59 Zone	1	0%
Total	2,022	100%

Source: Economic & Planning Systems

Industrial Zones	Firms in Industrial Zones	% All Firms in Subarea
Manufacturing	240	92%
Logistics	227	84%
Services	248	82%
Subtotal	715	86%

Source: InfoGroup; Economic & Planning Systems

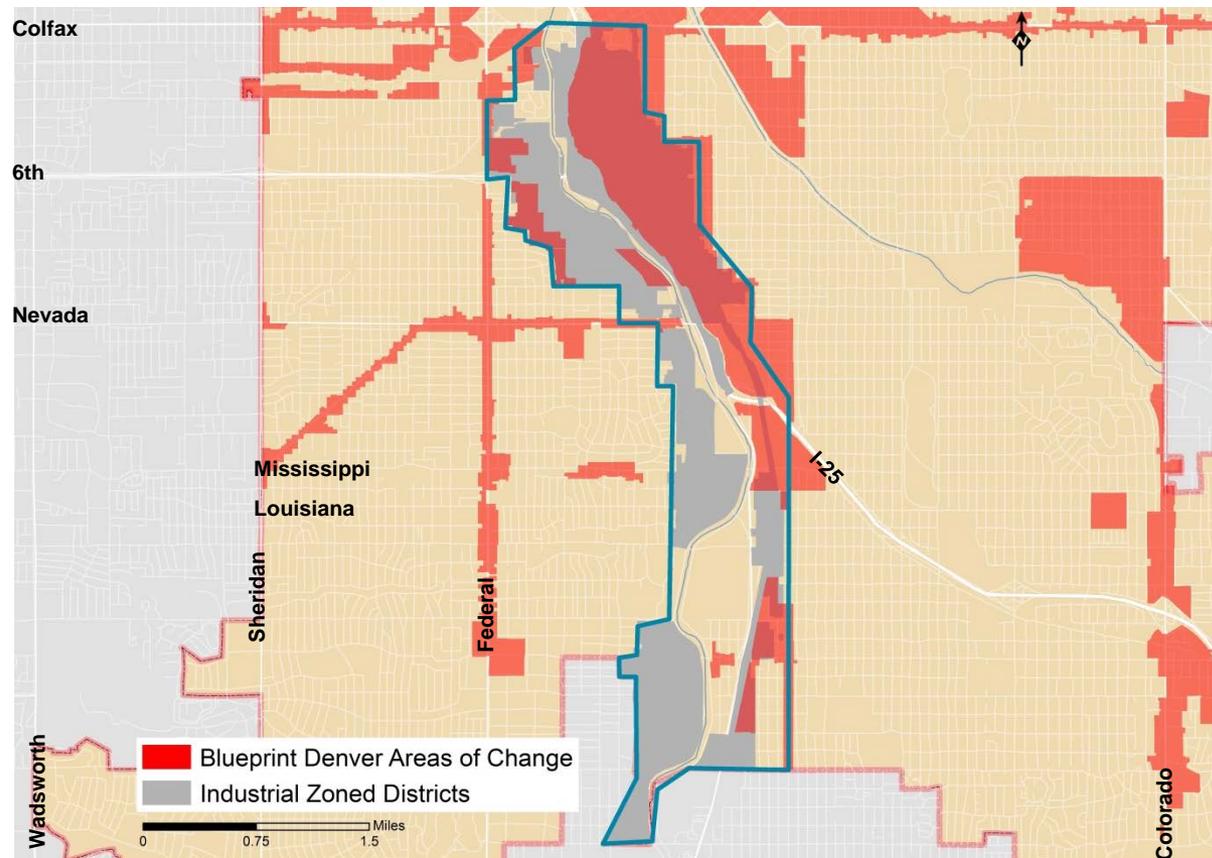


Source: City and County of Denver, Economic & Planning Systems

Supply Analysis

South Platte Corridor – Areas of Change

- There are 1,104 acres of land designated as AOC in the subarea. This represents 5% of the total AOC in the City
- Of the AOC designated land, 790 acres or 39% of the industrial zoned areas are designated as AOC

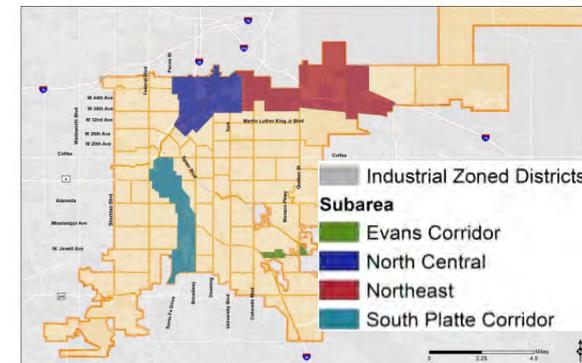


Source: City and County of Denver, Economic & Planning Systems

Supply Analysis

Evans Corridor – Overview

- There are 84 industrial firms and 1,487 industrial jobs in the Evans Corridor, the smallest of the subareas. There are 17 Manufacturing firms, 30 Logistics firms, and 30 Services firms
- While having only 17 firms, Manufacturing is the largest industrial employer in the subareas, with 639 workers. 532 of these workers are employed by two large manufacturing firms
- The average RBA for industrial firms in the Evans Corridor is approximately 20,000 sq. ft., and almost all of the industrial space in the corridor was built before 1999



Supply Analysis

Evans Corridor – Character



The Evans Corridor is primarily dominated by auto-oriented uses, including auto-shops (bottom-left), parts distributors (top-right), gas stations, and dealerships. The Corridor also has a number of self-storage facilities. Bottom-right is a picture of a bakery, which relies on the automobile access.

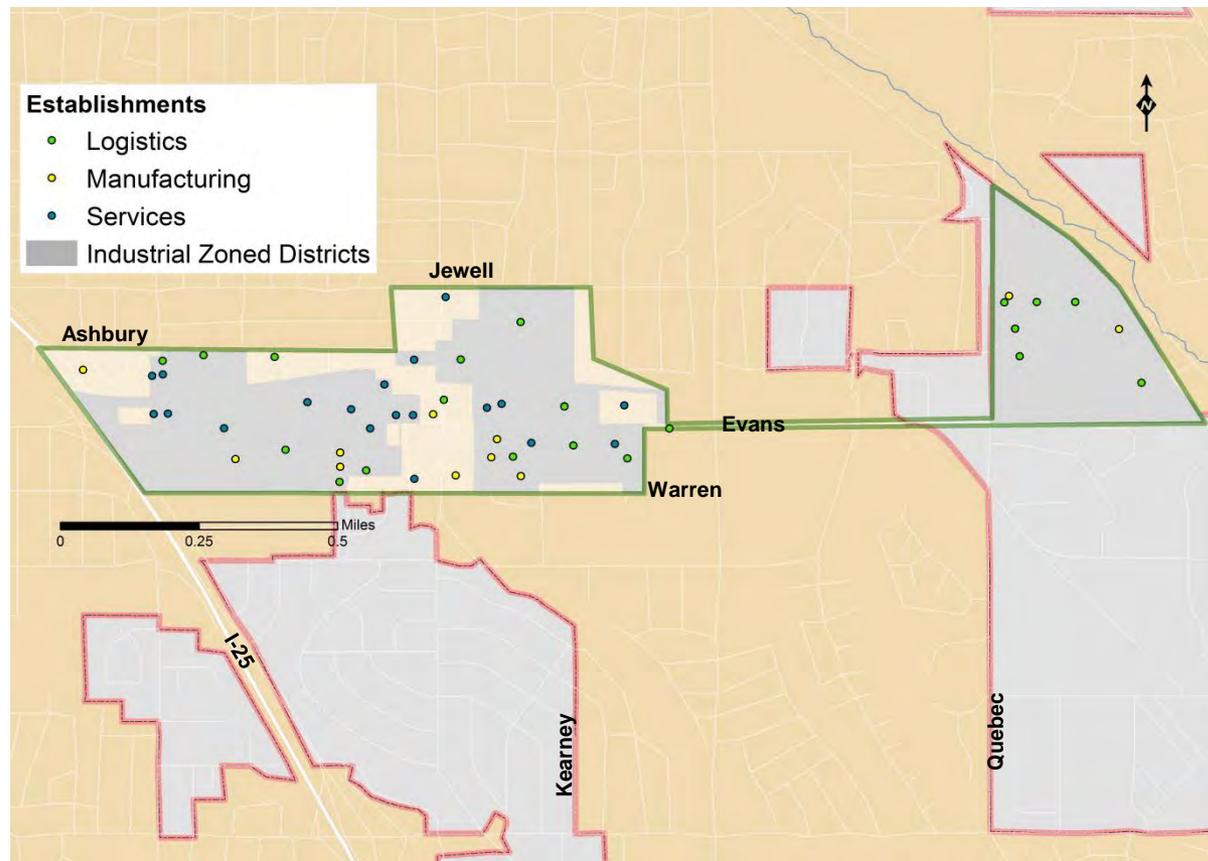
The images above are part of larger industrial facilities north of Evans and east of Quebec.

Supply Analysis

Evans Corridor – Industrial Firms

Description	Value	Percent
Building Info		
		<i>% Total</i>
Number of Buildings	64	2%
RBA (sq. ft.)	1,272,299	1%
RBA since 1999 (sq. ft.)	30,887	0%
Average RBA (sq. ft.)	19,880	---
Average Year Built	1973	---
Employment		
		<i>% Subtotal</i>
Manufacturing	639	43%
Logistics	460	31%
Services	<u>388</u>	<u>26%</u>
Subtotal	1,487	100%
Sales (\$000s)		
		<i>% Subtotal</i>
Manufacturing	57,665	14%
Logistics	281,589	68%
Services	<u>73,062</u>	<u>18%</u>
Subtotal	412,316	100%

Source: CoStar; InfoGroup; Economic & Planning Systems



Source: InfoGroup, Economic & Planning Systems

Supply Analysis

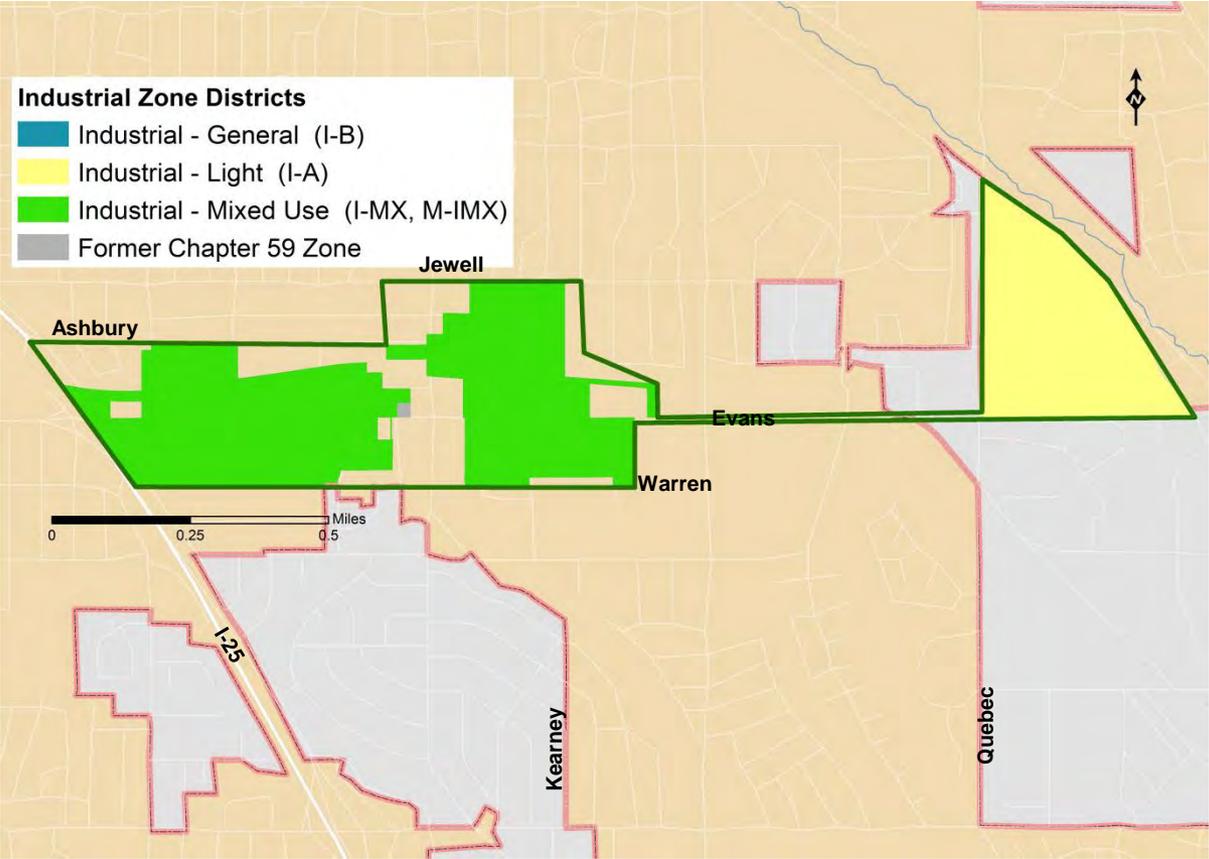
Evans Corridor – Zoning

Zoning	Acres	% Total
Industrial - Light (I-A)	66	33%
Industrial - General (I-B)	0	0%
Industrial - Mixed Use (I-MX, M-IMX)	133	67%
Former Chapter 59 Zone	0	0%
Total	199	100%

Source: Economic & Planning Systems

Industrial Zones	Firms in Industrial Zones	% All Firms in Subarea
Manufacturing	15	79%
Logistics	29	91%
Services	23	70%
Subtotal	67	80%

Source: InfoGroup; Economic & Planning Systems

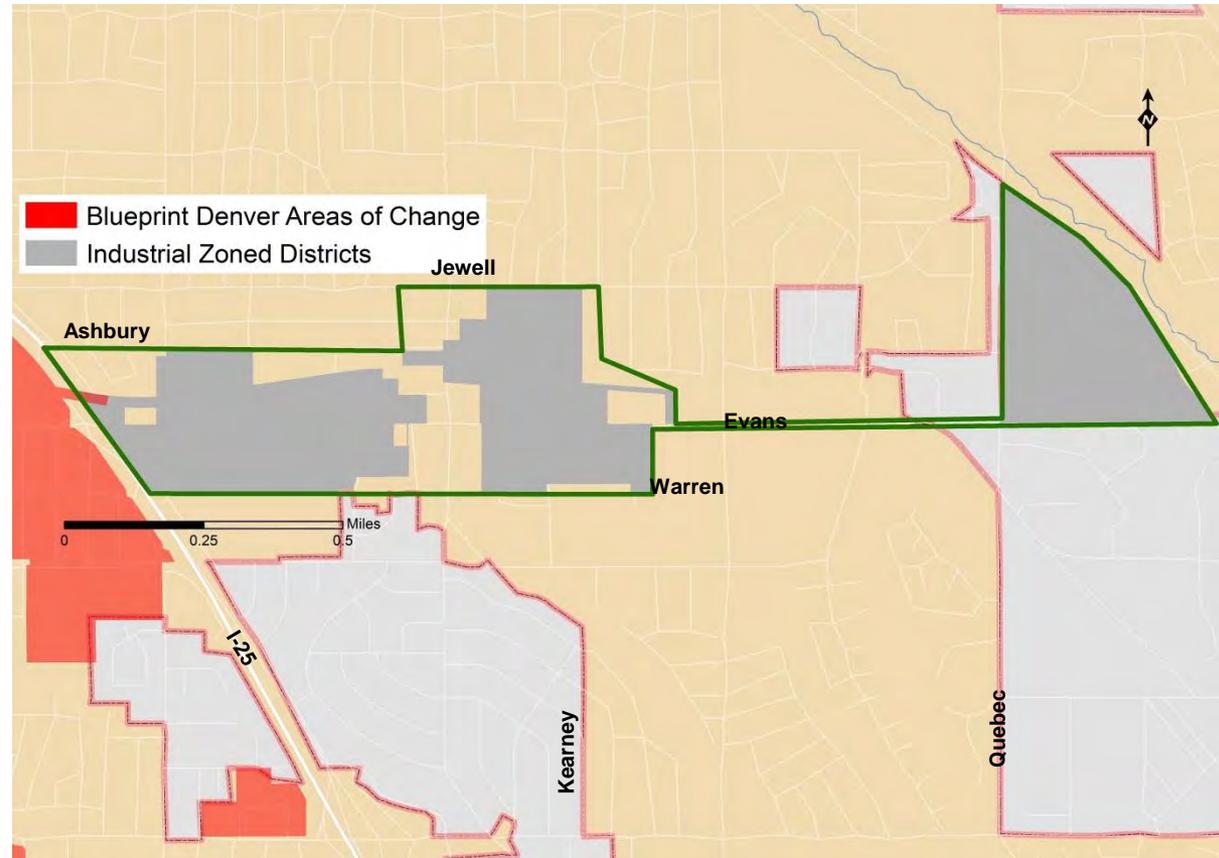


Source: City and County of Denver, Economic & Planning Systems

Supply Analysis

Evans Corridor – Zoning

- There are 0.6 acres of land designated as AOC in the subarea. This represents 0.0% of the total AOC in the City
- Of the AOC designated land, 0.5 acres or 0.3% of the industrial zoned areas are designated as AOC



Source: City and County of Denver, Economic & Planning Systems

Demand Forecasts

Employment Based

- Future employment growth of industrial oriented sectors was estimated using recent trends and Woods and Poole estimates
- A factor was applied to the estimate for employment (jobs) to account for jobs in industrial buildings and average jobs per square foot factors were used to estimate demand for space
- EPS estimates demand for **16 million square feet** of space over the next 25 years based on estimate job growth

Production Based

- Based on the rate of growth in the Metro Area from 1999 to 2016, the Metro Area inventory of industrial space will increase by 40 to 60 million square feet over the next 25 years
- Denver captured 26 percent of new construction in the Metro Areas since 1999
- At this capture rate, additional support of industrial space in Denver will range is between **10.5 and 15.5 million square feet** over the next 25 years

Demand Forecasts

Employment Based by Category

- Logistic space accounts for the majority of the employment based forecasted demand at approximately 11 million square feet of space or 68% of total demand
- Manufacturing and Services follows at 3 million square feet (19%) and 2 million (12%) respectively

Table: Employment Based Demand Forecast by Industrial Category

Description	Emp. Growth 2015-2035	Demand Factors		Demand Projections (Sq. Ft.)		
		Sq. Ft./Emp.	FAR	Building Area	Land	% Total
Manufacturing	4,171	750	0.30	3,128,136	10,427,120	19%
Logistics	14,932	750	0.30	11,198,780	37,329,267	68%
Services	4,083	500	0.30	2,041,634	6,805,447	12%
Total	23,186	706	0.30	16,368,550	54,561,834	100%

Source: Economic & Planning Systems



Demand versus Supply

Industrial Capacity

- Denver does not have enough industrial land to accommodate demand

Table: Employment Based Demand Forecast by Industrial Category

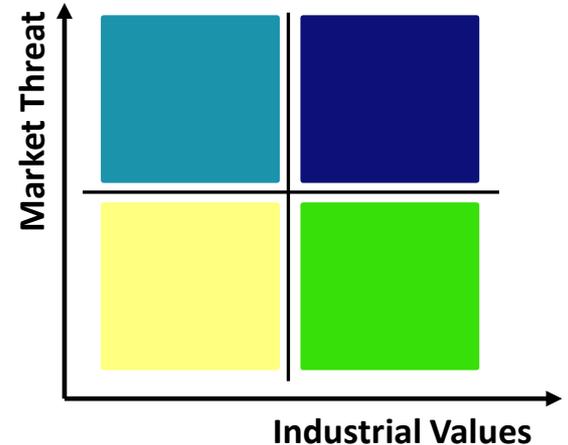
Land Capacity	Vacant Land (Square Feet)	Vacant Land (Acres)	Floor Area Ratio (Square Feet)	Building Capacity (Acres)	Average Size of Site
Land within I-A, I-B and I-MX districts	27,989,922	643	0.3	8,396,977	0.91
Land within I-A, I-B and I-MX districts with industrial land use designation	13,447,529	309	0.3	4,034,259	0.60
Estimated Demand	Land Demand (sf)	Land Demand (Acres)	Floor Area Ratio	Building Demand (sf)	
Jobs Based	54,561,834	1,253	0.3	16,368,550	
Development Trend Based (Low)	35,813,558	822	0.3	10,744,067	
Development Trend Based (High)	52,795,490	1,212	0.3	15,838,647	
Demand vs Supply	%				
Supply as percent of Demand (Low)	78%				
Supply as percent of Demand (High)	51%				

Source: City and County of Denver; Economic & Planning Systems

Assessment of Values and Threats

Framework

- The assessment of industrial land aims to categorize areas by weighting both the industrial values of industrial land and market threats of redevelopment in order to derive an appropriate policy decision
- As a framework for understanding the interaction between these two forces, industrial areas were put into grids to measure the value the areas have for industrial uses and the market threats impacting them
- This initial framework was developed by EPS based on analysis of best practices and research to identify ways to value industrial areas and assess threats
- The City and County of Denver may want to recalibrate certain values or threats to better match with community values and strategic initiatives



Assessment of Values and Threats

Suggested Values and Threats

Industrial Values

- **Manufacturing jobs**
- **Proximity to workforce**
- **Quality of building stock**
- **Proximity to freight transit or highways**
- Proximity to business clusters
- Presence of advanced manufacturing or growing industries
- Higher fiscal impact
- Location of brownfields
- Connection to other economic development initiatives

Market Threats

- **Proximity to transit**
- **Proximity to urban centers**
- **High land values**
- **Proximity to residential growth**
- Environmental hazard for surrounding community
- High industrial vacancy

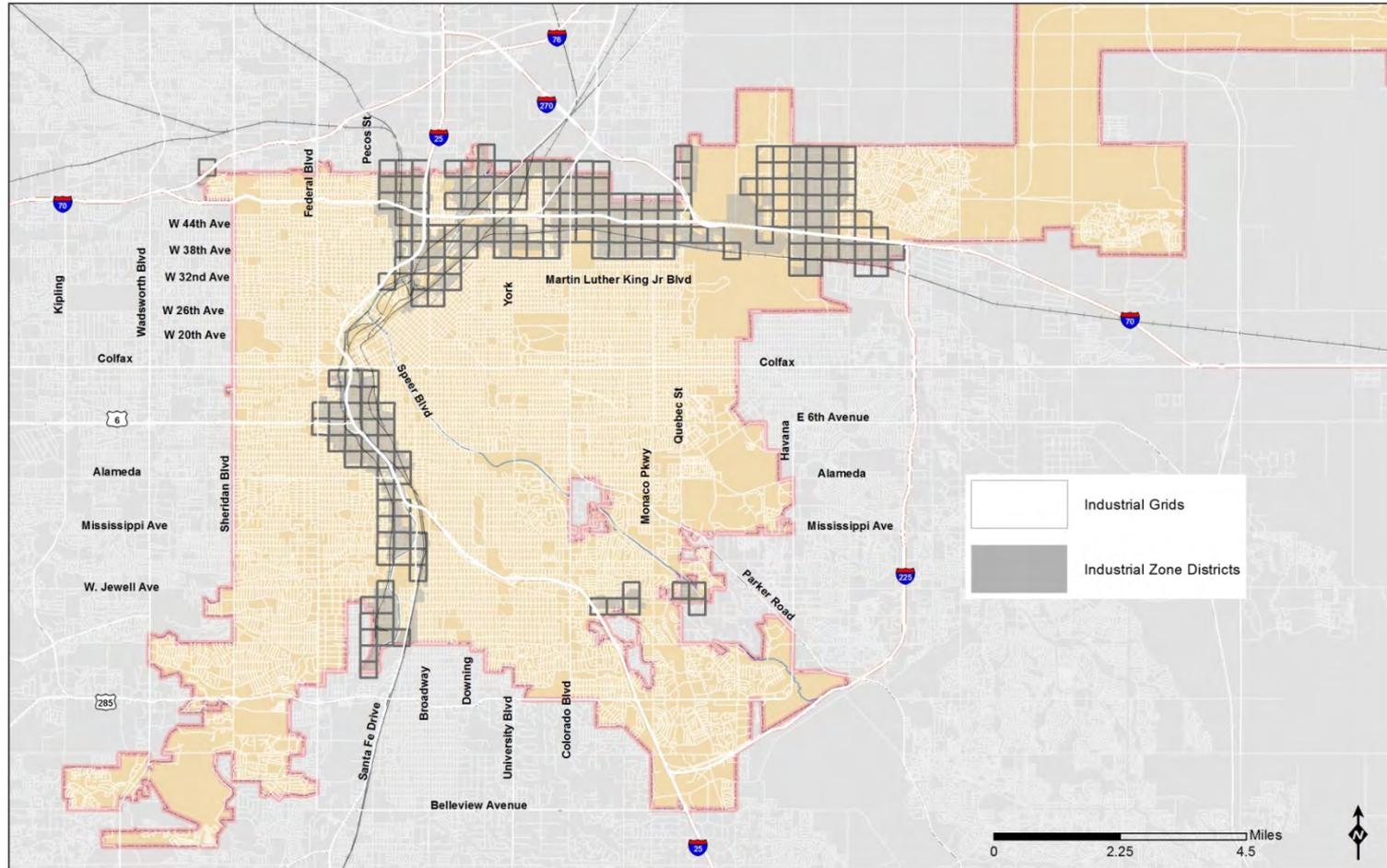
Used in analysis

Other potential factors



Assessment of Values and Threats

Industrial Areas (Grids)

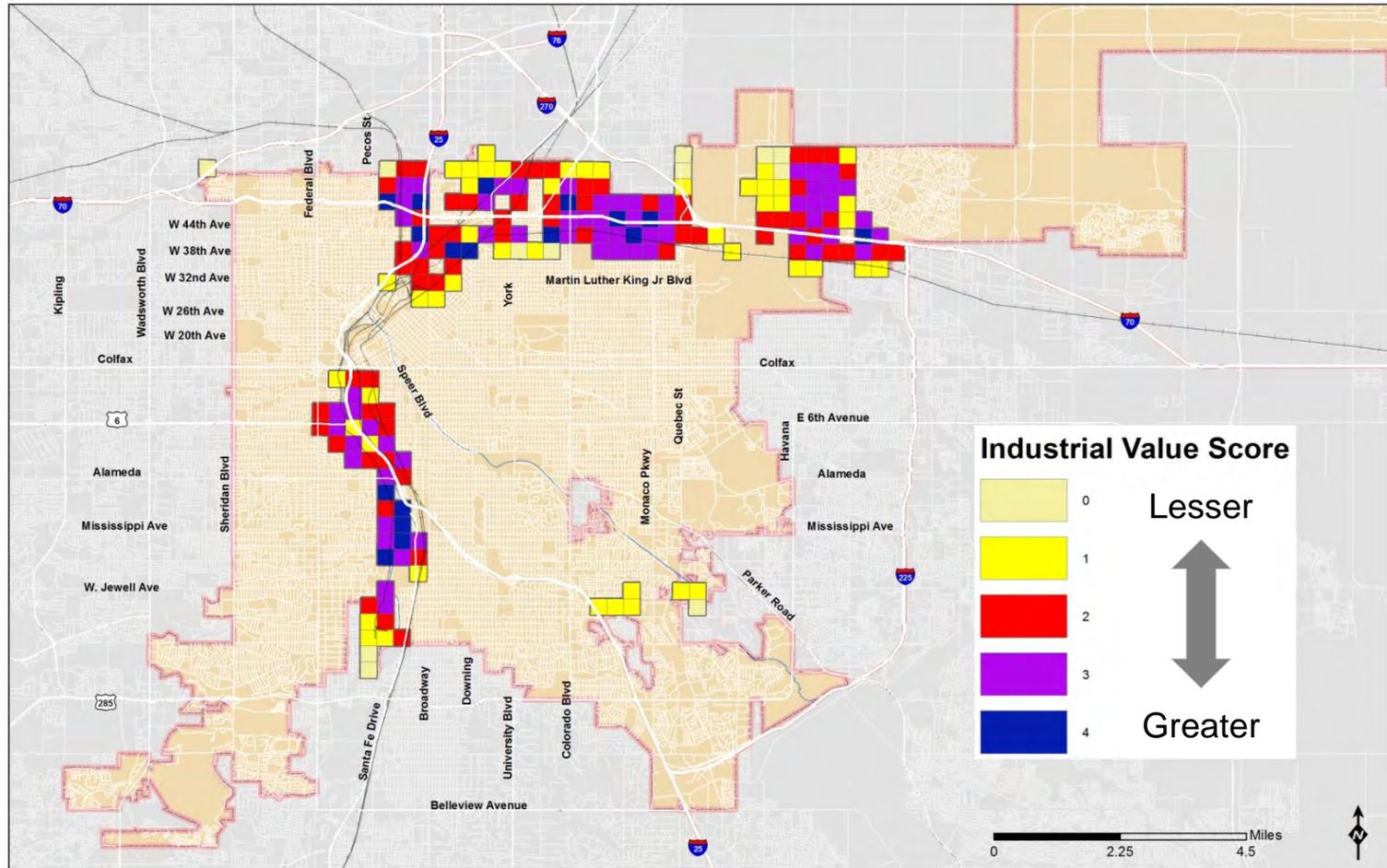


Source: MIG Grid Game, Economic & Planning Systems

Grids based on a planning participation game MIG is running , looking at various scenarios to accommodate growth.

Assessment of Values and Threats

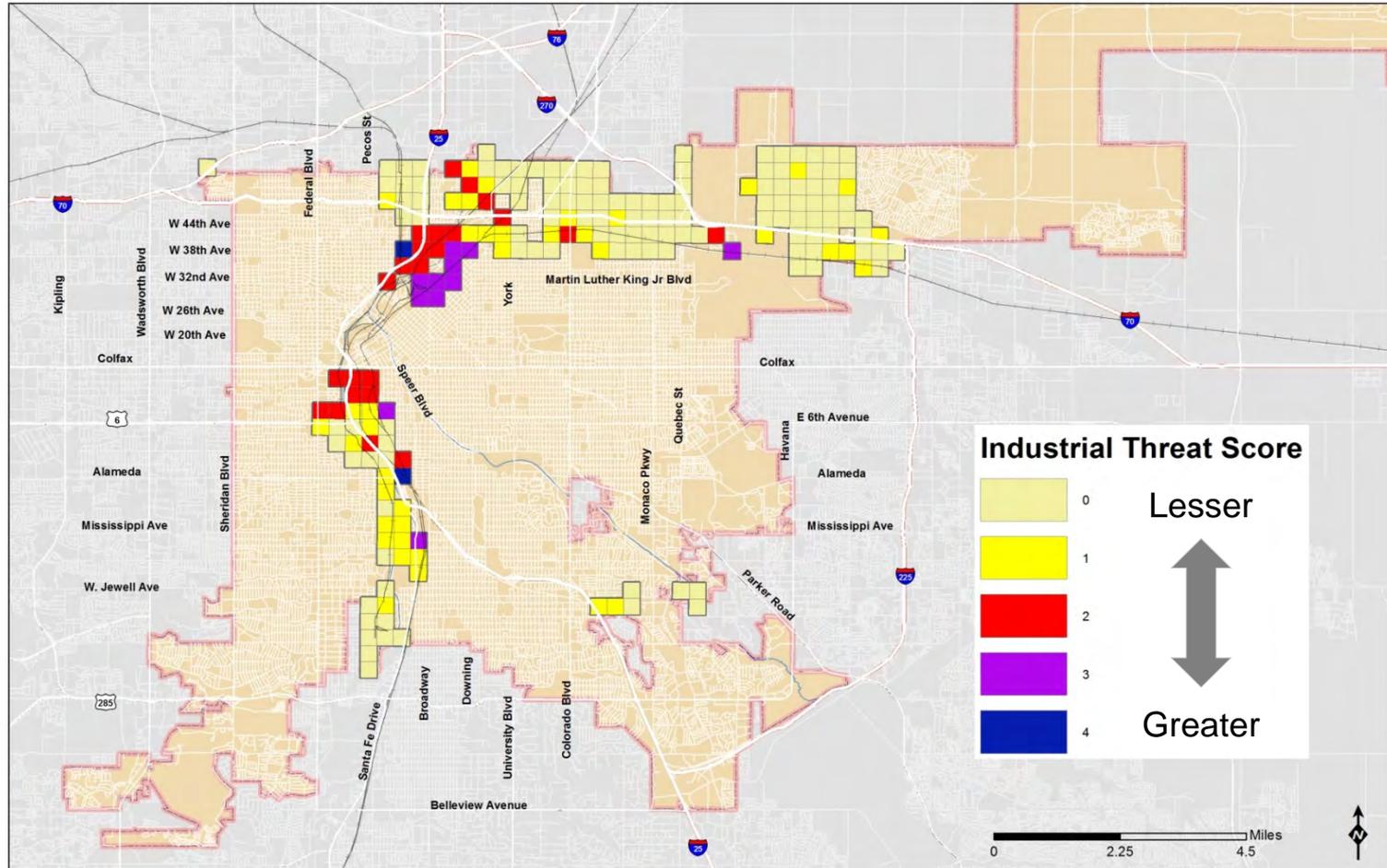
Industrial Values



Source: Economic & Planning Systems

Assessment of Values and Threats

Market Threats

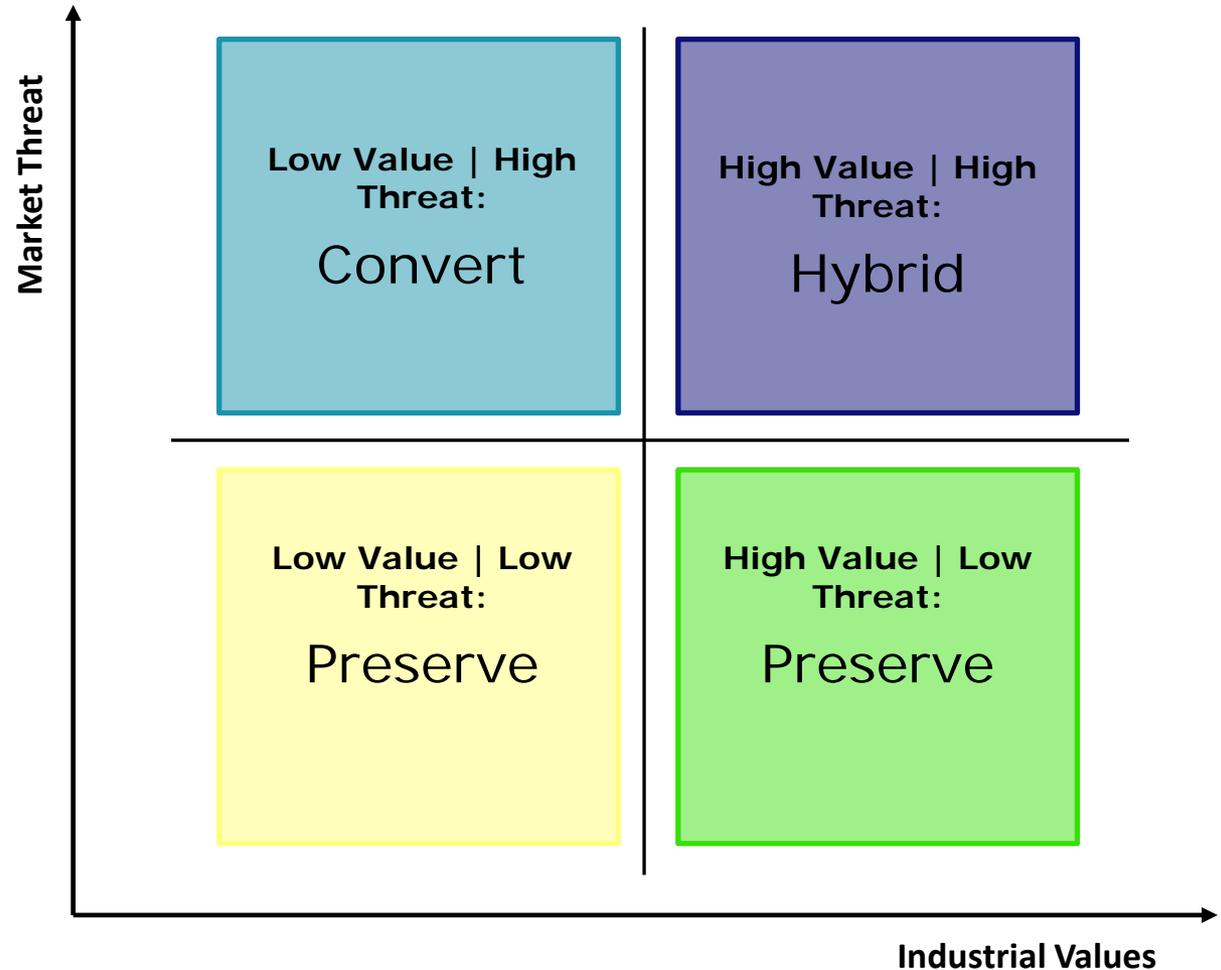


Source: Economic & Planning Systems

Assessment of Values and Threats

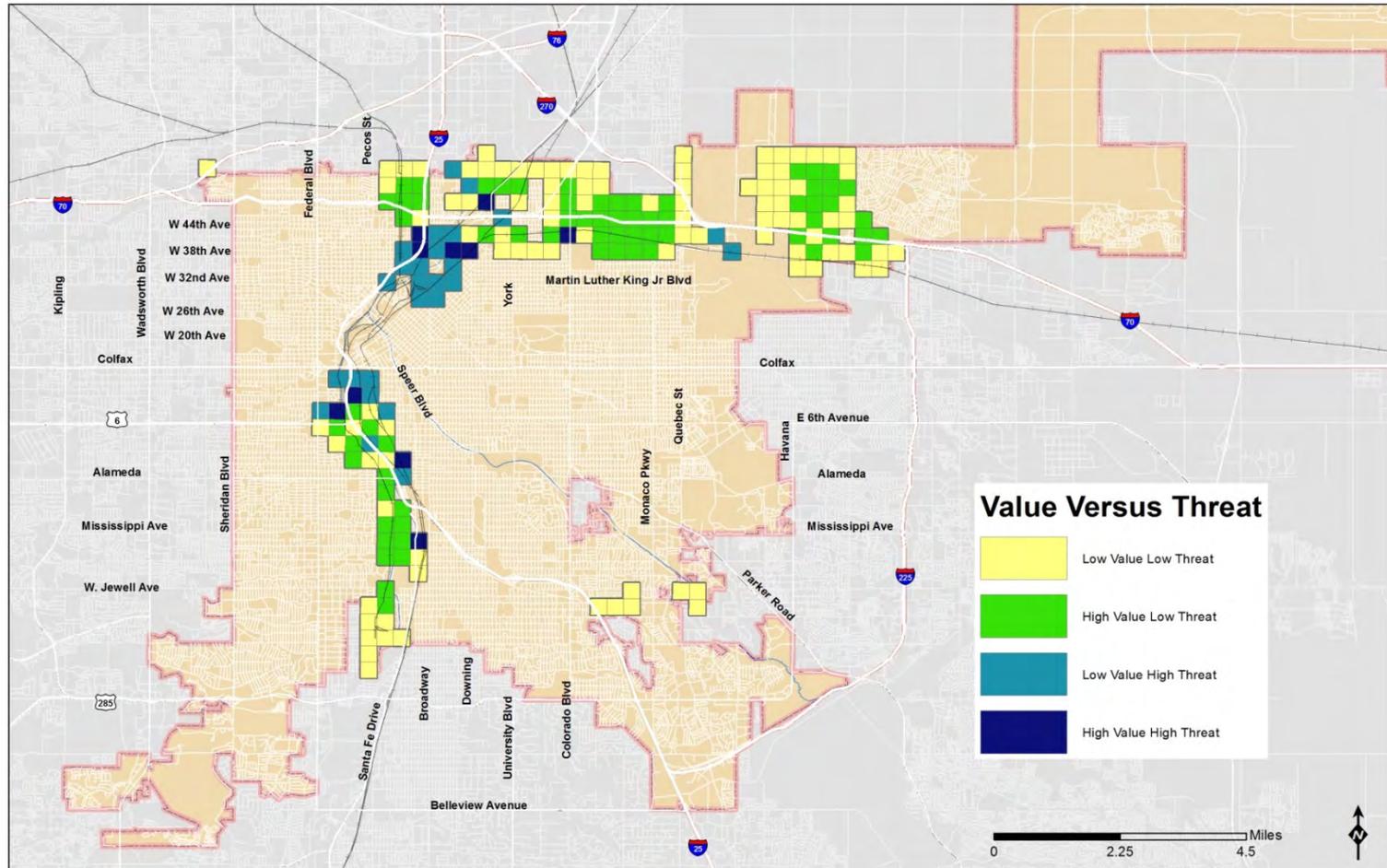
Framework

- The industrial areas (grids) were categorized based on their relative industrial values and market threats
- The goal is to identify areas worth preserving and areas that can be considered for higher and better uses



Assessment of Values and Threats

Value vs. Threat



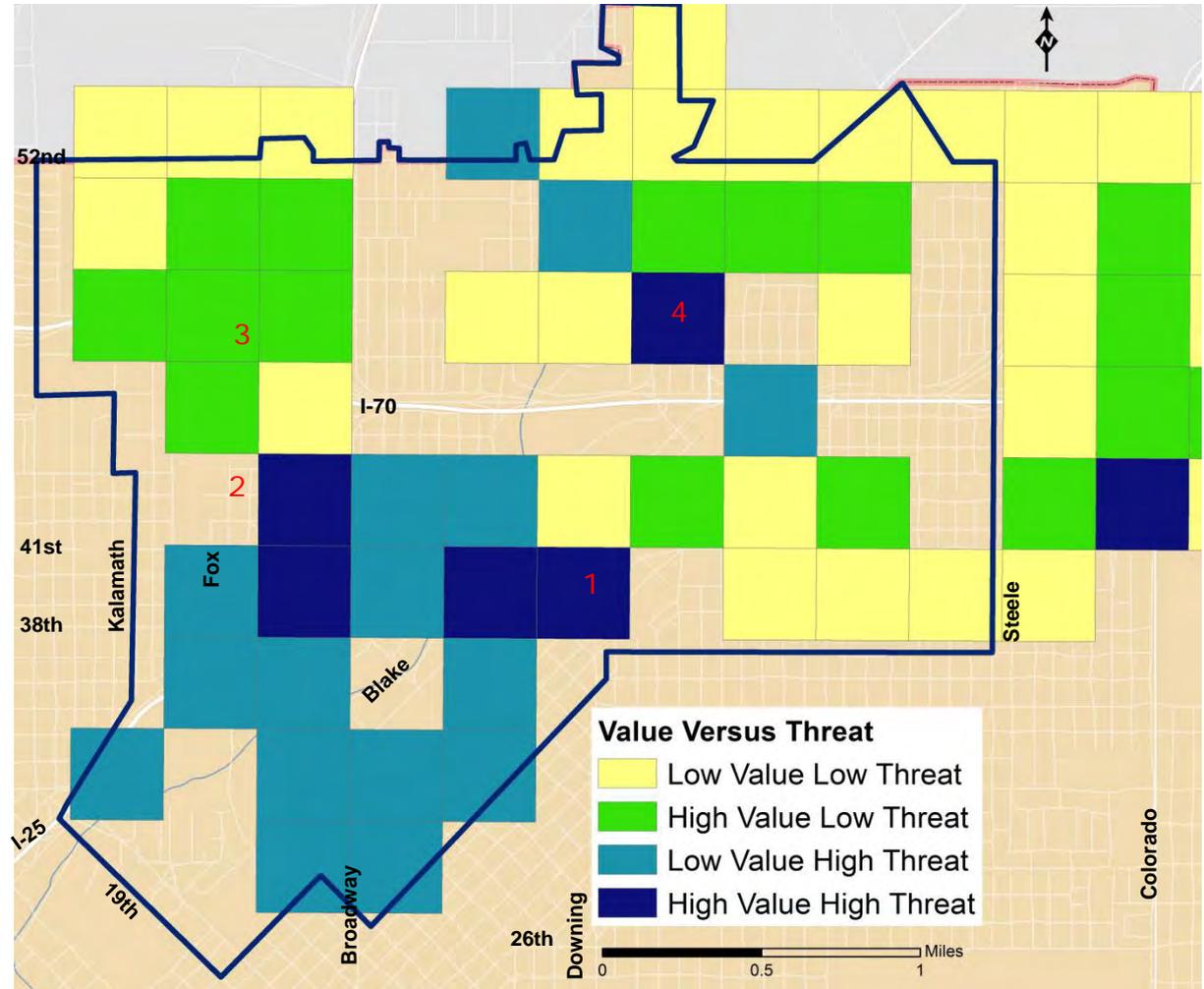
Source: Economic & Planning Systems

Assessment of Values and Threats

North Central

Description	RBA	% Total
Low Value Low Threat	4,652,510	30%
High Value Low Threat	4,358,825	28%
Low Value High Threat	4,515,100	30%
High Value High Threat	<u>1,775,237</u>	<u>12%</u>
Total	15,301,672	100%

Source: CoStar; Economic & Planning Systems



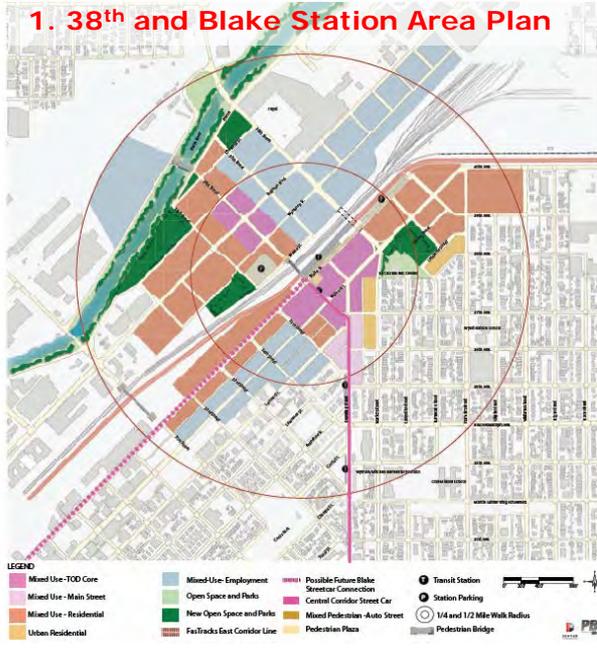
Source: Economic & Planning Systems

1. 38th and Blake Station Area Plan
2. 41st and Fox Station Area Plan
3. Globeville Neighborhood Plan
4. Elyria and Swansea Neighborhood Plan

Assessment of Values and Threats

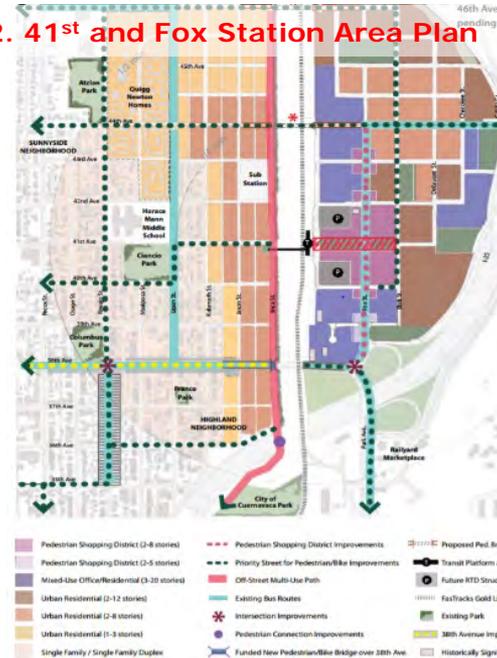
North Central – Neighborhood Plans

1. 38th and Blake Station Area Plan



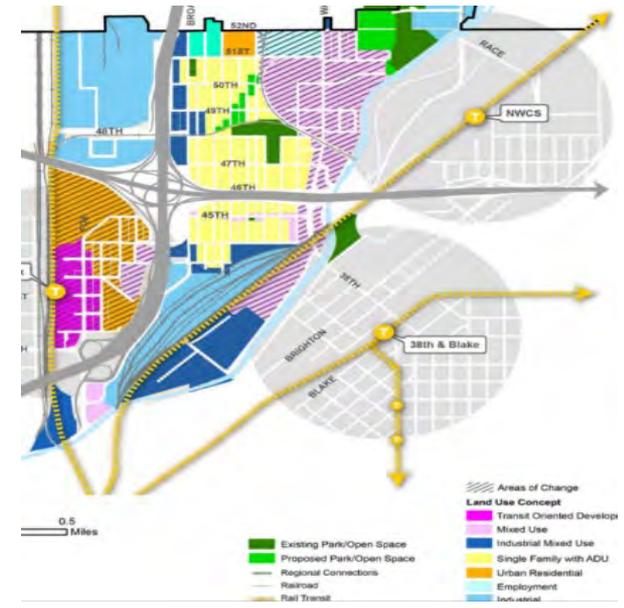
ALIGN – The 38th and Blake station area plan calls for the conversion of industrial land uses to support a variety of mixed uses, largely in support of TOD. There is both “High Value High Threat” and “Low Value Low Threat” areas surrounding the station. There may be opportunities to help support “High Value High Threat” areas and SUMs in the area either through non-profit actors or incentives.

2. 41st and Fox Station Area Plan



POTENTIAL CONFLICT – The 41st and Fox Station area plan does not call for the preservation of industrial land and, instead, shows a conversion of land to mixed-use zones and residential. This analysis finds that there are areas of “High Value Low Threat,” suggesting that, at least in the near term, these areas should be preserved. There are also areas of “High Value High Threat,” suggesting a hybrid approach.

3. Globeville Neighborhood Plan

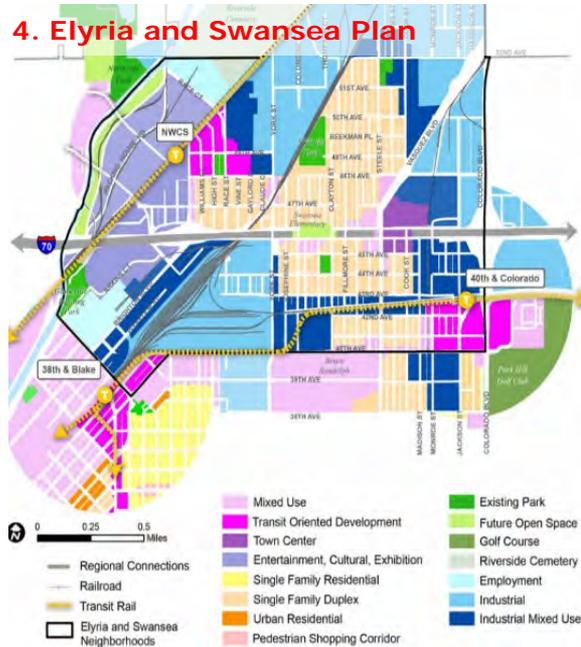


POTENTIAL CONFLICT – The Globeville Plan calls for a conversion of industrial lands northeast of Argo Park and west of the Platte River. This analysis finds that some of these areas have “High Value Low Threat,” suggesting that preservation may be the best approach.

Assessment of Values and Threats

North Central – Neighborhood Plans

4. Elyria and Swansea Plan



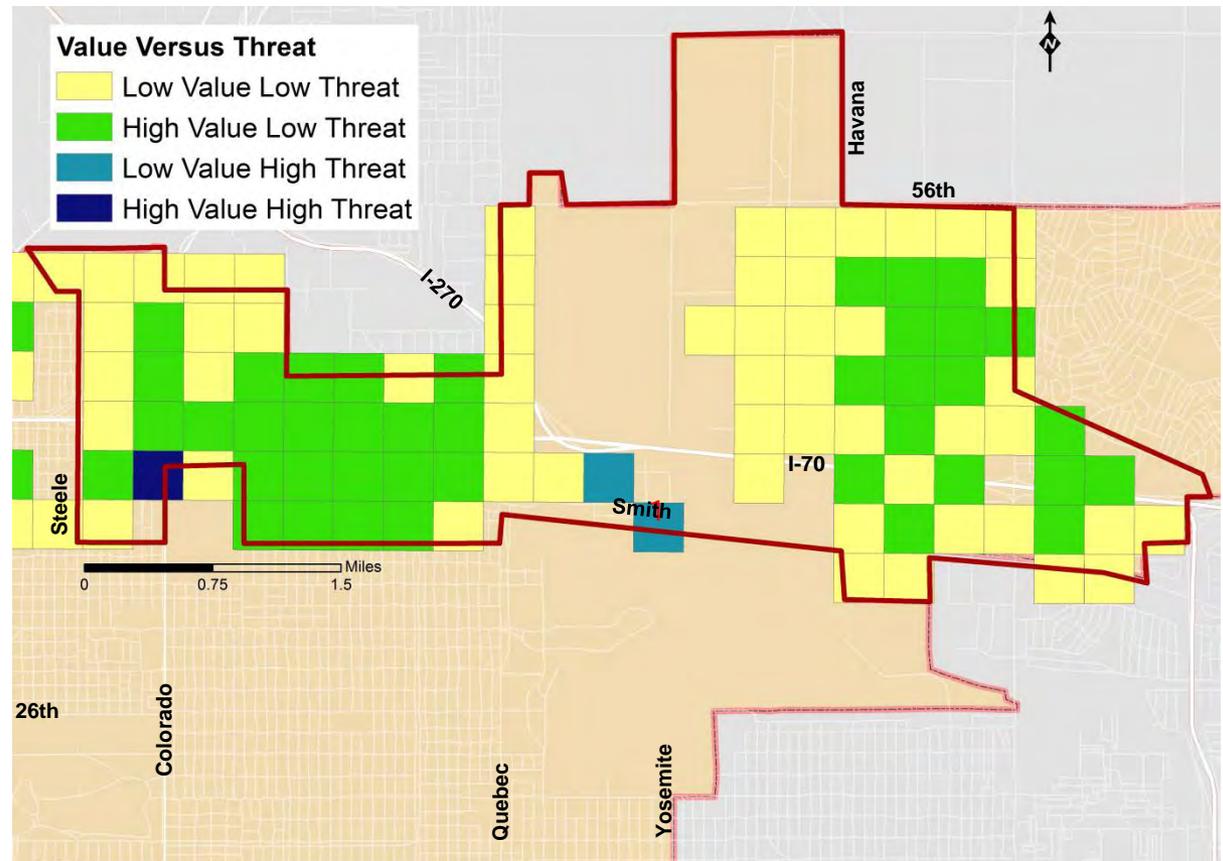
POTENTIAL CONFLICT – The study identifies the 40th and Colorado area as a “High Value High Threat” area, which suggests that a hybrid approach should be taken to determine the right mix of conversion and preservation. The neighborhood plan encourages a mix residential and commercial uses as part of TOD plan. Moreover, there are some areas identified for preservation in the plan that are “Low Value High Threat.”

Assessment of Values and Threats

Northeast

Description	RBA	% Total
Low Value Low Threat	18,198,379	41%
High Value Low Threat	26,301,006	59%
Low Value High Threat	18,158	0%
High Value High Threat	<u>309,337</u>	<u>1%</u>
Total	44,826,880	100%

Source: CoStar; Economic & Planning Systems



Source: Economic & Planning Systems

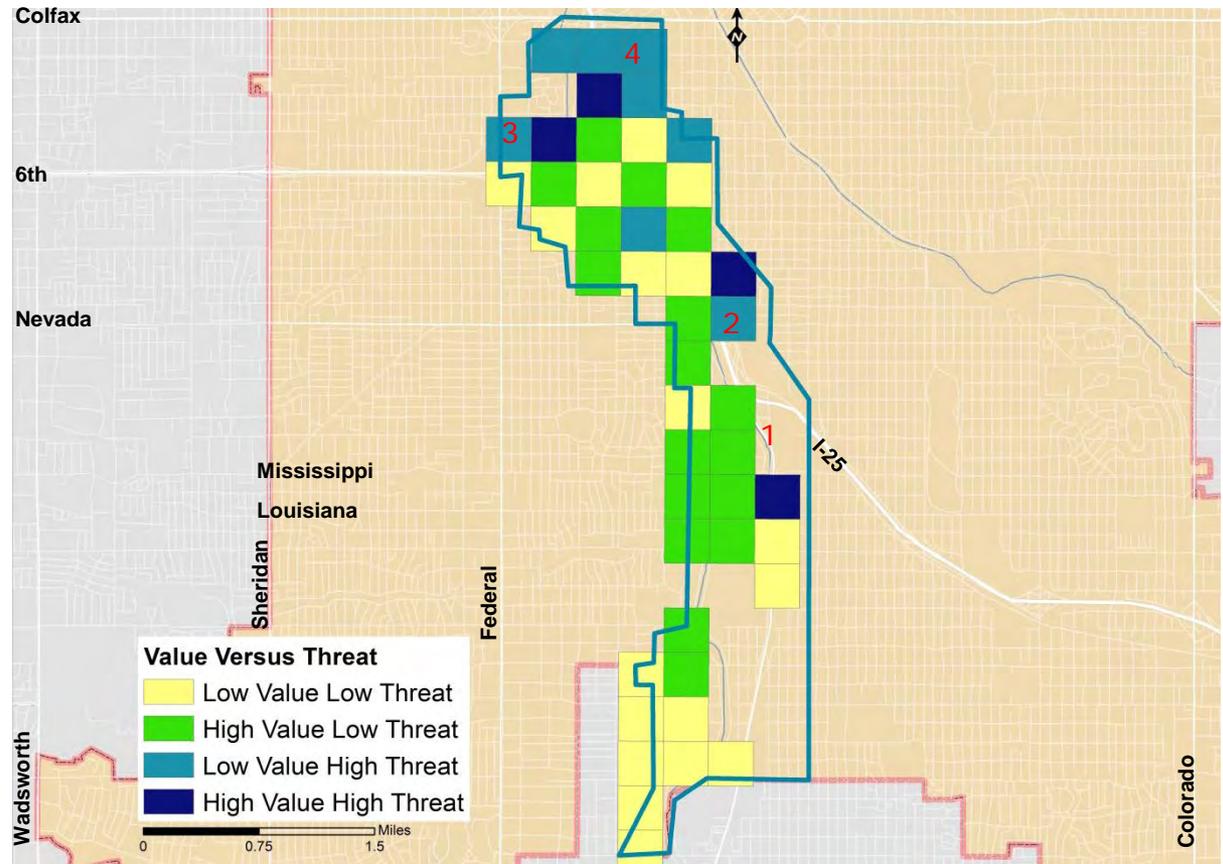
1. Central Park Boulevard Station Area Plan

Assessment of Values and Threats

South Platte Corridor

Description	RBA	% Total
Low Value Low Threat	3,434,122	20%
High Value Low Threat	9,199,721	54%
Low Value High Threat	2,137,109	13%
High Value High Threat	<u>2,175,790</u>	<u>13%</u>
Total	16,946,742	100%

Source: CoStar; Economic & Planning Systems



Source: Economic & Planning Systems

1. I-25 Broadway Station Area Plan
2. Alameda Station Area Plan
3. Decatur Federal Station Area Plan
4. Auraria Station West Area Plan

Assessment of Values and Threats

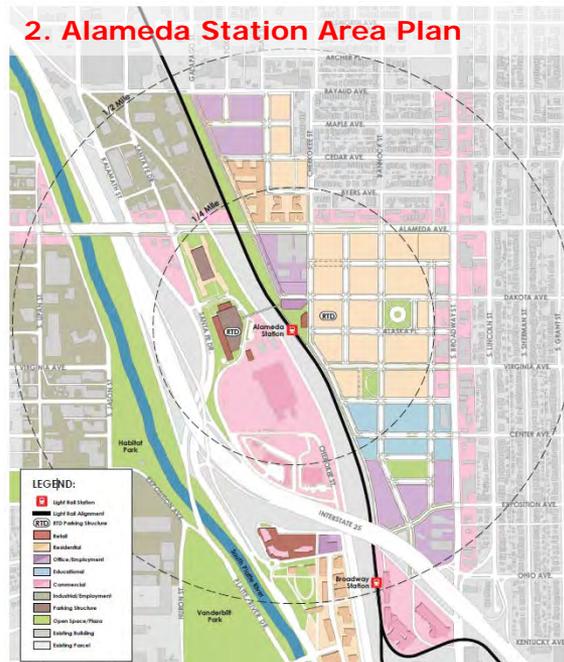
South Platte Corridor – Neighborhood Plans

1. I-25 Broadway Station Area Plan



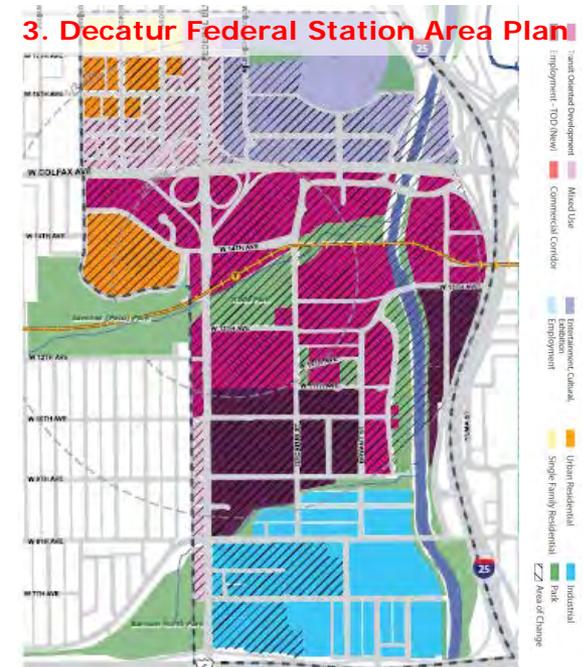
POTENTIAL CONFLICT – The plan supports the rezoning of existing industrial land south of W. Tennessee Ave into mixed use areas, allowing this area to transition to residential and commercial. In the analysis, this area is categorized as “High Value Low Threat,” which suggests that preservation is the most appropriate action at this time.

2. Alameda Station Area Plan



POTENTIAL CONFLICT – The plan supports the preservation of industrial areas south of Bayaud Ave. and north of Alameda. The analysis identifies this area as “Low Value High Threat,” which suggests that conversion of the land to mixed-use may be appropriate.

3. Decatur Federal Station Area Plan

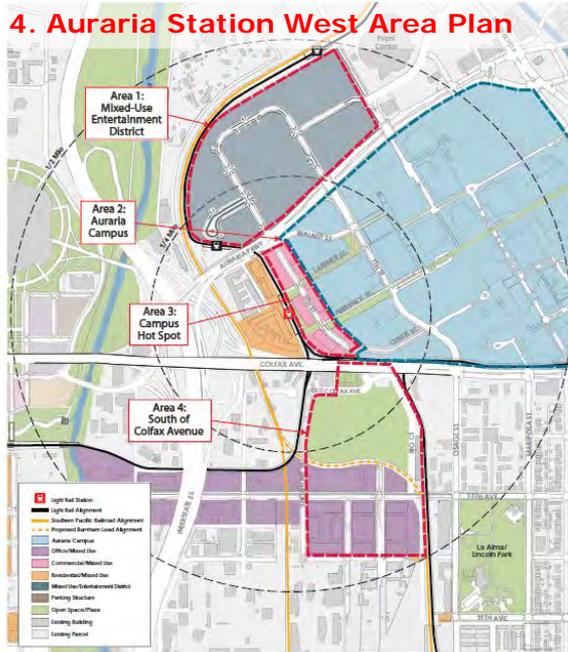


ALIGN – The plan calls for the area to be mixed-use industrial with commercial and residential uses being concentrated near the station and along Federal Boulevard. The analysis finds that this area is largely of “Low Value High Threat” for industrial uses with a section of the area being “High Value High Threat.” Such categorization supports conversion and more mixed-use industrial areas.

Assessment of Values and Threats

South Platte Corridor – Neighborhood Plans

4. Auraria Station West Area Plan



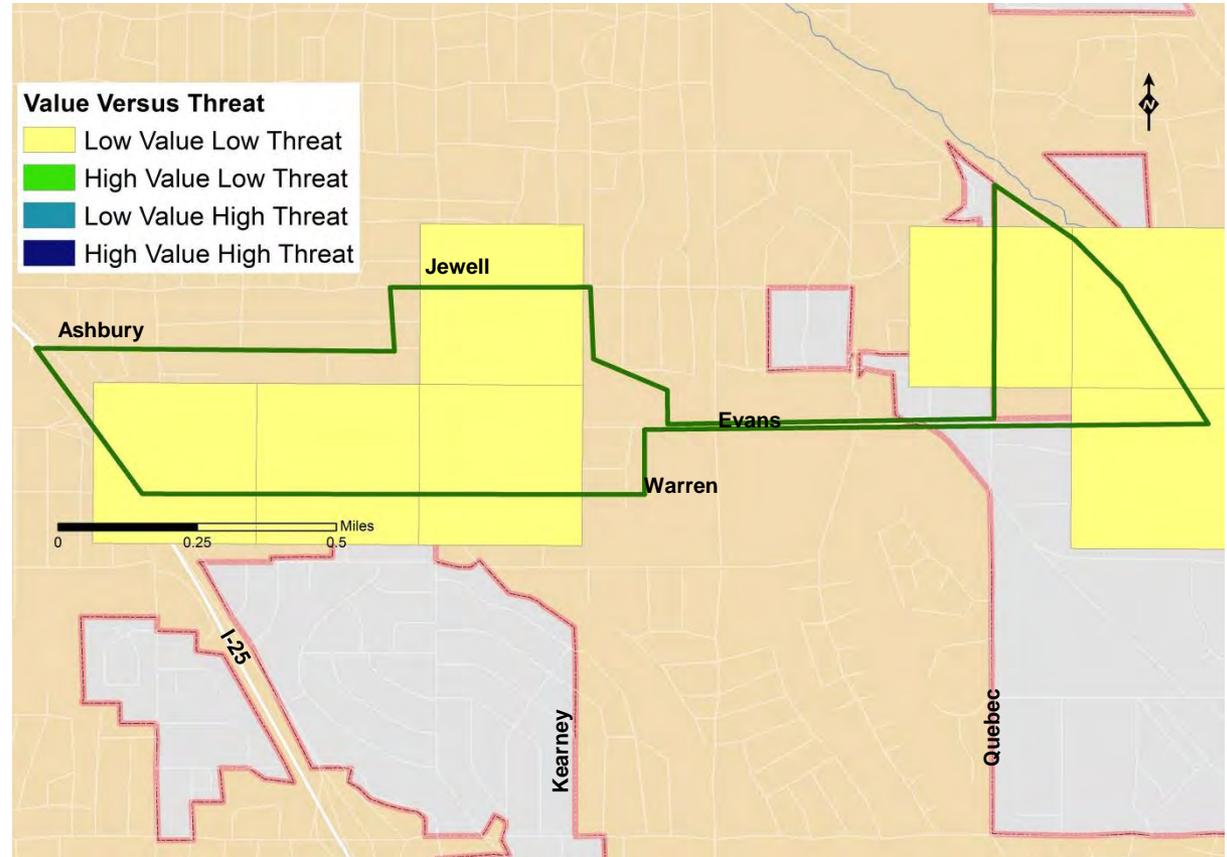
ALIGN – The plan calls for an industrial area south of Colfax to become a mixed use industrial area with Office/Employment uses as well as some light industrial uses. This aligns with the analysis’s categorization of a “Low Value Low Threat” area, suggesting that conversion may be the most appropriate action at this time.

Assessment of Values and Threats

Evans Corridor – Zoning

Description	RBA	% Total
Low Value Low Threat	1,127,538	100%
High Value Low Threat	0	0%
Low Value High Threat	0	0%
High Value High Threat	0	0%
Total	1,127,538	100%

Source: CoStar; Economic & Planning Systems



Source: Economic & Planning Systems

Recommendation/Next Steps

Summary of Findings

- Industrial uses are a valuable component of Denver as they contribute to the fiscal health of the City and provide middle-skilled jobs to residents
- However, the industrial oriented sectors are evolving. Demands and characteristics for space are changing, and demands for jobs are decreasing, despite growing output
- Manufacturing jobs appear to be more valuable as they provide higher wages and have a greater opportunity for value added services; however, Denver's manufacturing base is small and not growing as quickly as other industrial categories
- Manufacturers are trending to smaller and more centralized locations while logistics businesses are demanding larger buildings and superior regional transportation access

Recommendation/Next Steps

Summary of Findings

- The neighborhoods surrounding industrial areas in Denver are home to significant amount of industrial employees. Changes or redevelopment within industrial areas may impact the residential composition of surrounding neighborhoods
- There is future demand for industrial spaces located in central Denver along I-70 and I-25
- The qualities of Denver's industrial areas that are valuable to industrial users vary within each subarea, with some subareas being more valuable than others. However, all industrial areas in Denver have value to the City, including fiscal benefits resulting from real and personal property tax
- The industrial areas in Denver threatened by market forces are limited but concentrated in areas near downtown and transit stations

Recommendation/Next Steps

Summary of Findings

- The analysis provides a framework for understanding tradeoffs as well as a baseline identification of industrial areas under market threat. This baseline should be reviewed and, if necessary, recalibrated based on policy priorities, and input from the planning process including results from the community outreach exercise.
- EPS believes the majority of industrial areas are worth preserving while a few areas may have greater value to the larger Denver community as residential and/or commercial uses
- Areas identified as **Low Value High Threat** present the best opportunity for redevelopment with the least disruption to the current industrial market. For example, these areas have fewer manufacturing businesses, more outmoded building types, and a weaker nexus to areas with high industrial employment

Recommendation/Next Steps

Summary of Findings

- There are a limited number of areas that are **High Value High Threat**. These areas need to be closely examined by policy makers to determine if potential uses outweigh the value of preserving industrial uses. These areas may require targeted solutions to address and balance competing interests
- Areas identified as **Low Value Low Threat** and **High Value Low Threat** are considered to be critical assets needed to accommodate current and future industrial uses
- Denver's current planning and zoning/regulatory approaches to areas under threat have been to encourage redevelopment (plans) and allow for a mixture of uses including residential uses (zoning). This approach likely will result in industrial uses being priced out. This is a transitional policy direction and should be reconsidered

Recommendation/Next Steps

Summary of Findings

- There are two main approaches to industrial areas:
 1. A preservation approach that tries to limit non-industrial uses in industrial areas that would drive up land values. There are many good examples nationally for this preservation approach
 2. An integrated approach that would allow a mixture of uses but may require substantive policy and monetary investment by the City to preserve industrial uses in a mixed use environment. There are limited examples of successful integration of industrial uses in mixed use areas however there are industrial-oriented uses that can co-exist with other uses
- Approaches are not mutually exclusive, but direction is needed from the City to inform the development community, clarified with further exploration of policies and implementation actions

Recommendation/Next Steps

Summary of Findings

- Not all of the neighborhood and station plan recommendations align with the assessment and threat findings of the study
- It is important to note that these plans often operate on longer time horizons (e.g. 20 year plans) than the assessment of values and threats, which does not reflect future land use aspirations and market conditions
- Further, the report uses 50-acre grids, connecting this analysis to other aspects of Blueprint Denver. However, this geography may not be the most natural or useful unit of analysis when comparing findings of this report to the neighborhood plans

Implementation/Tool Box

Preserve – Primary Findings

- An imperative for protecting industrial lands can rest on a number of findings:
 1. Supply of industrial land is quickly reaching a minimum threshold. It is harder to achieve density in industrial land uses than residential and commercial uses
 2. Industrial land uses provide critical support functions to commercial and residential uses, and close proximity is an important provision of this support
 3. Industrial land uses are important employers of low and middle skill jobs, and worker proximity between existing residential areas and these jobs is important
 4. Industrial land uses are highly sensitive to rent levels, and without protection, marginal demand for residential and commercial uses can crowd out demand for residential uses

For more information see:

➤ Dempwolf, C. Scott, "An Evaluation of Recent Industrial Land Use Studies: Do Theory and History Matter in Practice?," Berkeley Center for Community Innovation, 2009

Implementation/Tool Box

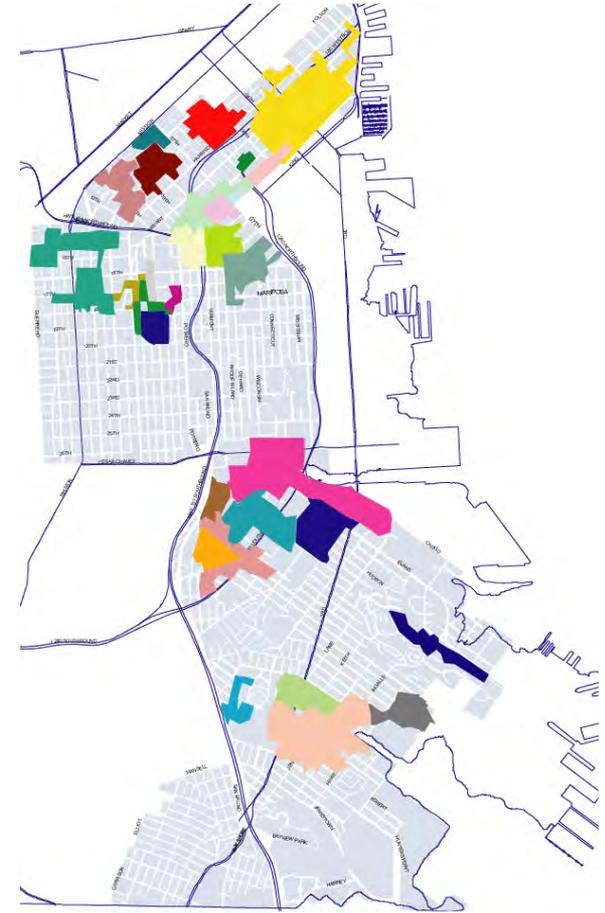
Preserve – Strategies

- **Zoning Classifications:** The primary method to protect industrial land is to restrict the use of this land and preclude non-industrial uses. Non-industrial uses refer to residential and commercial buildings, but restrictions may also target uses like storage facilities that have higher residual land values than industrial, but provide little employment
- **Buffer Zones:** As a corollary to preservation of industrial lands, the establishment of buffer zone between industrial facilities and surrounding uses can help mitigate some of the negative impacts of industrial uses, including truck traffic
- **Workforce Development and Other Economic Development Tools:** In addition to land use policies, workforce development and other economic development tools and policies, including investment in infrastructure, can help support industrial uses and employment

Implementation/Tool Box

Preserve – Case Studies

- IG1 and EDx Zones: Employment zoning districts that limit uses to industrial or employment uses. Varying levels of limited commercial development are allowed with square feet maximums in industrial areas. Housing is a conditional use in employment areas if meeting identified criteria. *Central Eastside Plan, Portland, OR*
- Urban Innovation Zones: 100% industrial allowed but can accommodate 10 to 15 percent of project as commercial with a specific FARs limits. *Cornfields Arroyo SECO Specific Plan, Los Angeles, CA*
- Production, Distribution, Repair (PDR) Zones: Special zone districts allowing the industrial uses desired while allowing limited commercial development. Incentive to encourage to increase employment density. *Eastern Neighborhoods Plan San Francisco, CA*



PDR clusters San Francisco

Implementation/Tool Box

Preserve – Case Studies

- Key Employment Area: Identification of key employment areas and a requirement to retain job capacity in this areas. Retention of employment capacity may be maintained through increased intensification in applicable areas. *Employment Lands Preservation, San Jose, CA*

Implementation/Tool Box

Convert – Primary Findings

- A conclusion that conversion of industrial land is the most appropriate policy action primarily rests on a finding of a high opportunity cost for preservation. The opportunity costs can include other policy goals like TOD around transit stops, affordable housing production, conversion to other uses that have more middle-skill jobs, etc.
- A recommendation of conversion can also result from the low value of industrial land itself, whether it be due to obsolete building structures or poor access to important infrastructure
- The Assessment of Value and Threats presented in this study attempts to make this opportunity cost analysis and the weighing of trade-offs between preservation and conversion explicit
- Given that the forecasted demand for industrial land exceeds the current supply, the City should apply conversion actions sparingly

Implementation/Tool Box

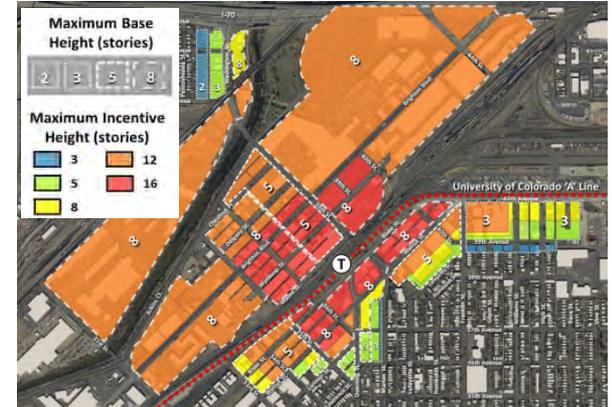
Convert – Strategies

- **Rezoning:** Rezoning industrial lands to incentivize residential, commercial, and mixed-use development is one strategy to incentivize conversion
- **Conversion Criteria:** Some cities have shifted responsibility to justify conversion onto the private sector. These cities typically publish conversion criteria making explicit the public costs and benefits of conversion. Developers are then required to justify conversion to industrial land uses based on these criteria
- **Impact Fees:** Some cities have tied impact fees to conversion and redevelopment of industrial land. While these fees are typically meant to cover impacts to public infrastructure, they may also be used to support industrial development
- **Brownfield Remediation:** Incentives for brownfield remediation can support conversion

Implementation/Tool Box

Convert – Case Studies

- Incentive Height Overlay: An overlay that increased the development capacity and, thus, the residual land value of an area can conversion of uses from industrial to mixed-use. *Height Incentive Overlay, 38th and Blake Station Area Plan, Denver, CO*
- Extraordinary Economic Benefit from Conversion: An extraordinary economic benefit is defined as a significant off-setting fiscal benefit, and may include affordable housing, parks, and related infrastructure improvements. The benefit could also take the form of a capital contribution for investments in economic development, a mitigation for, or a land offset to replace the converted industrial land. *Employment Lands Preservation, San Jose, CA*



Height incentives from 38th and Blake Station Area Plan, Denver, CO

Implementation/Tool Box

Hybrid/Complex Preservation – Primary Findings

- A policy of a hybrid or complex preservation attempts to both preserve targeted industrial uses while at the same time allowing for mixed-use development
- Such a policy may be pursued if there are high value industrial clusters, like clusters of SUMs, in areas where the development of non-industrial uses are important for other policy goals – like TOD
- Given the sensitivity of industrial uses to rent increases and, relatedly, the low residual land value of industrial uses relative to residential and commercial development, it is difficult to achieve this balance without either overly prescriptive land use policies or other types of market interventions

Implementation/Tool Box

Hybrid/Complex Preservation – Strategies

- **Mixed-Use Industrial:** For certain industrial uses, mixed-use industrial is physically possible. However, it would require development incentives given lower rents from industrial uses
- **Non-Profit Developers:** Non-Profit development, similar to an affordable housing model, would be one strategy to make industrial development in these hybrid areas possible
- **Industrial Development Fund:** An industrial land fund, for example, supported by impacts fees from conversion, would be another possibility to support industrial uses throughout a city and especially in these hybrid areas. This fund could be connected to non-profit development
- **Calibrated Conversion Criteria:** Calibrating conversion criteria to support/protect certain types of industrial development is another strategy to create these hybrid areas

Implementation/Tool Box

Hybrid/Complex Preservation – Case Studies

- PDF Business Plan: Requires developers to create a viable financial model based on reasonable rental rates for production, distribution, and repair (PDR) uses. Identifies targeted sectors for space. *PDR Business Plan, SFMade and Five-Point Plan for PDR, San Francisco, CA*
- Performance Districts: Hybrid industrial category using performance standards that regulate air/noise pollution, maintenance and delivery schedules, and storage/vibration standards instead of uses. *Cornfields Arroyo SECO Specific Plan, Los Angeles, CA*



Rendering of SFMade proposed PDR use

For more information see:

➤ *Pratt Center, "What Makes a City Run," April 2016*



APPENDIX

Appendix

A.1 – Data Sources Used

Data Source	Description
Bureau of Labor Statics QCEW	Employment and wage information by 2- and 3-digits NAICS Codes . Used to define the industrial and manufacturing sector
Bureau of Labor Statics OES	Employment and wage information for Occupational Employment Statistics (OES) and to define industrial-oriented jobs
InfoGroup 2016	Location and descriptive information of industrial establishments. Descriptive information includes: NAICS Code, employment, square foot category, and sales
CoStar	Industrial inventory information, including rentable building area (RBA), building characteristics, rent, and vacancy
Economic Census Non-Employer	Output or receipts of industrial sector by 2-digit NAICS
CTPP	Census bureau data. Provides a cross tab of number of jobs by occupation and NAICS sector
LEHD LODES	Location of Goods-Producing home and work employment tracts.

Appendix

A.2 – References

Acemoglu, Daron and Pascual Restrepo, "Robots and Jobs: Evidence from US Labor Markets," NBER, March 2017

Chapple, Karen, "Industrial Land and Jobs Study," UC Berkeley, September 2016

Dempwolf, C. Scott, "An Evaluation of Recent Industrial Land Use Studies: Do Theory and History Matter in Practice?," Berkeley Center for Community Innovation, 2009

Hamm, Kevin, "Marijuana in Denver," Denver Post Online, 2016

Mistry, Nisha and Joan Byron, "The Federal Role in Supporting Urban Manufacturing," What Works Collaborative, April 2011

Pratt Center, "What Makes a City Run," April 2016

Sisson, Patrick, "How 4 cities are using manufacturing to build equitable economies," Curbed, September 2016

ULI, "High Tech Manufacturers moving to smaller factories, bigger warehouses," Urban Land Magazine, November 2015

Interviews with a range of commercial brokers and developers conducted in the spring of 2017.

Appendix

A.3 Employment Trends

Description	2000	2005	2010	2015	2000-2015			2010-2015		
					Total	Ann. #	Ann. %	Total	Ann. #	Ann. %
DENVER CITY AND COUNTY										
All Employment										
Industrial Jobs	122,785	102,686	88,571	101,122	-21,663	-1,444	-1.3%	12,551	2,510	2.7%
Other Sectors	<u>346,358</u>	<u>321,955</u>	<u>332,021</u>	<u>377,249</u>	<u>30,891</u>	<u>2,059</u>	<u>0.6%</u>	<u>45,228</u>	<u>9,046</u>	<u>2.6%</u>
Total	469,143	424,641	420,592	478,371	9,228	615	0.1%	57,779	11,556	2.6%
% Industrial	26.2%	24.2%	21.1%	21.1%	-5.0%	-0.3%	-1.4%	0.08%	0.02%	0.08%
Industrial Jobs										
Manufacturing	31,233	24,074	19,321	21,123	-10,110	-674	-2.6%	1,802	360	1.8%
Logistics	64,606	55,399	51,020	57,306	-7,300	-487	-0.8%	6,286	1,257	2.4%
Services	<u>26,946</u>	<u>23,213</u>	<u>18,230</u>	<u>22,693</u>	<u>-4,253</u>	<u>-284</u>	<u>-1.1%</u>	<u>4,463</u>	<u>893</u>	<u>4.5%</u>
Subtotal	122,785	102,686	88,571	101,122	-21,663	-1,444	-1.3%	12,551	2,510	2.7%
DENVER MSA										
All Employment										
Industrial Jobs	308,925	281,649	239,777	283,494	-25,431	-1,695	-0.6%	43,717	8,743	3.4%
Other Sectors	<u>869,888</u>	<u>893,913</u>	<u>935,391</u>	<u>1,094,379</u>	<u>224,491</u>	<u>14,966</u>	<u>1.5%</u>	<u>158,988</u>	<u>31,798</u>	<u>3.2%</u>
Total	1,178,813	1,175,562	1,175,168	1,377,873	199,060	13,271	1.0%	202,705	40,541	3.2%
% Industrial	26.2%	24.0%	20.4%	20.6%	-5.6%	-0.4%	-1.6%	0.17%	0.03%	0.17%
Industrial Jobs										
Manufacturing	84,705	72,767	61,541	68,431	-16,274	-1,085	-1.4%	6,890	1,378	2.1%
Logistics	127,753	116,999	110,321	125,341	-2,412	-161	-0.1%	15,020	3,004	2.6%
Services	<u>96,467</u>	<u>91,883</u>	<u>67,915</u>	<u>89,722</u>	<u>-6,745</u>	<u>-450</u>	<u>-0.5%</u>	<u>21,807</u>	<u>4,361</u>	<u>5.7%</u>
Subtotal	308,925	281,649	239,777	283,494	-25,431	-1,695	-0.6%	43,717	8,743	3.4%

Source: Bureau of Labor Statistics; Economic & Planning Systems

Appendix

A.4 Employment Trends by 3-Digit NAICS

Description	Code	2000	2005	2010	2015	2000-2015			2010-2015		
						Total	Ann. #	Ann. %	Total	Ann. #	Ann. %
Manufacturing											
Food Manufacturing	311	5,659	5,190	4,961	4,935	-724	-48	-0.9%	-26	-5	-0.1%
Beverage and Tobacco Product Manufacturing	312	1,480	1,476	1,460	1,655	175	12	0.7%	195	39	2.5%
Textile Product Mills	314	531	540	316	313	-218	-15	-3.5%	-3	-1	-0.2%
Apparel Manufacturing	315	793	455	236	294	-499	-33	-6.4%	58	12	4.5%
Wood Product Manufacturing	321	571	647	483	596	25	2	0.3%	113	23	4.3%
Paper Manufacturing	322	1,517	855	686	688	-829	-55	-5.1%	2	0	0.1%
Printing and Related Support Activities	323	4,005	2,622	1,753	1,976	-2,029	-135	-4.6%	223	45	2.4%
Chemical Manufacturing	325	869	887	630	806	-63	-4	-0.5%	176	35	5.1%
Plastics and Rubber Products Manufacturing	326	1,887	1,581	1,146	1,311	-576	-38	-2.4%	165	33	2.7%
Nonmetallic Mineral Product Manufacturing	327	1,553	1,438	1,045	1,194	-359	-24	-1.7%	149	30	2.7%
Primary Metal Manufacturing	331	193	194	186	324	131	9	3.5%	138	28	11.7%
Fabricated Metal Product Manufacturing	332	2,863	2,088	1,682	1,905	-958	-64	-2.7%	223	45	2.5%
Machinery Manufacturing	333	1,667	950	925	846	-821	-55	-4.4%	-79	-16	-1.8%
Computer and Electronic Product Manufacturing	334	1,332	570	505	239	-1,093	-73	-10.8%	-266	-53	-13.9%
Electrical Equipment, Appliance, and Component Manufacturing	335	483	225	463	1,022	539	36	5.1%	559	112	17.2%
Transportation Equipment Manufacturing	336	363	290	261	189	-174	-12	-4.3%	-72	-14	-6.3%
Furniture and Related Product Manufacturing	337	2,270	1,805	1,031	1,232	-1,038	-69	-4.0%	201	40	3.6%
Miscellaneous Manufacturing	339	2,410	1,889	1,475	1,570	-840	-56	-2.8%	95	19	1.3%
Subtotal		30,510	23,785	19,321	21,109	-9,401	-627	-2.4%	1,788	358	1.8%
Logistics											
Merchant Wholesalers, Durable Goods	423	18,569	15,757	14,279	16,711	-1,858	-124	-0.7%	2,432	486	3.2%
Merchant Wholesalers, Nondurable Goods	424	9,178	8,384	7,847	8,701	-477	-32	-0.4%	854	171	2.1%
Wholesale Electronic Markets and Agents and Brokers	425	1,495	1,851	2,258	1,617	122	8	0.5%	-641	-128	-6.5%
Air Transportation	481	14,742	12,281	11,320	12,780	-1,962	-131	-0.9%	1,460	292	2.5%
Truck Transportation	484	4,249	3,130	2,690	3,011	-1,238	-83	-2.3%	321	64	2.3%
Transit and Ground Passenger Transportation	485	2,473	2,240	2,729	3,309	836	56	2.0%	580	116	3.9%
Support Activities for Transportation	488	2,334	2,844	2,544	3,483	1,149	77	2.7%	939	188	6.5%
Warehousing and Storage	493	3,268	2,549	2,083	2,279	-989	-66	-2.4%	196	39	1.8%
Subtotal		56,349	49,036	45,750	52,012	-4,337	-289	-0.5%	6,262	1,252	2.6%
Services											
Utilities	221	3,224	3,015	3,232	3,285	61	4	0.1%	53	11	0.3%
Construction of Buildings	236	5,602	4,092	3,033	5,240	-362	-24	-0.4%	2,207	441	11.6%
Heavy and Civil Engineering Construction	237	2,487	2,618	2,303	2,049	-438	-29	-1.3%	-254	-51	-2.3%
Specialty Trade Contractors	238	15,633	13,489	9,661	12,119	-3,514	-234	-1.7%	2,458	492	4.6%
Repair and Maintenance	811	3,312	2,882	2,738	2,809	-503	-34	-1.1%	71	14	0.5%
Subtotal		30,258	26,096	20,967	25,502	-4,756	-317	-1.1%	4,535	907	4.0%
TOTAL		117,117	98,917	86,038	98,623	-18,494	-1,233	-1.1%	12,585	2,517	2.8%

Source: Bureau of Labor Statistics; Economic & Planning Systems

Appendix

A.5 Wage Trends

Description	2000	2005	2010	2015	2000-2015			2010-2015		
					Total	Ann. #	Ann. %	Total	Ann. #	Ann. %
DENVER CITY AND COUNTY										
All Employment										
Industrial Wage	\$42,966	\$49,223	\$55,929	\$65,116	\$22,150	\$1,477	2.8%	\$9,187	\$1,837	3.1%
Other Sectors	<u>\$48,545</u>	<u>\$53,733</u>	<u>\$62,126</u>	<u>\$69,282</u>	<u>\$20,737</u>	<u>\$1,382</u>	<u>2.4%</u>	<u>7,155</u>	<u>1,431</u>	<u>2.2%</u>
Total	\$44,346	\$50,061	\$57,885	\$65,171	\$20,825	\$1,388	2.6%	7,286	1,457	2.4%
% Industrial	96.9%	98.3%	96.6%	99.9%	3.0%	0.2%	0.2%	3.3%	0.7%	0.7%
Industrial Jobs										
Manufacturing	\$37,544	\$44,252	\$49,244	\$53,976	\$16,432	\$1,095	2.4%	\$4,732	\$946	1.9%
Logistics	\$45,118	\$50,862	\$56,826	\$68,665	\$23,547	\$1,570	2.8%	\$11,839	\$2,368	3.9%
Services	<u>\$44,090</u>	<u>\$50,467</u>	<u>\$60,501</u>	<u>\$66,523</u>	<u>\$22,433</u>	<u>\$1,496</u>	<u>2.8%</u>	<u>\$6,022</u>	<u>\$1,204</u>	<u>1.9%</u>
Subtotal	\$42,966	\$49,223	\$55,929	\$65,116	22,150	1,477	2.8%	9,187	1,837	3.1%
DENVER MSA										
All Employment										
Industrial Jobs	\$45,061	\$51,122	\$59,102	\$67,404	\$22,343	\$1,490	2.7%	\$8,302	\$1,660	2.7%
Other Sectors	<u>\$42,246</u>	<u>\$46,448</u>	<u>\$53,619</u>	<u>\$60,599</u>	<u>\$18,354</u>	<u>\$1,224</u>	<u>2.4%</u>	<u>\$6,981</u>	<u>\$1,396</u>	<u>2.5%</u>
Total	\$41,254	\$45,950	\$52,877	\$59,865	\$18,610	\$1,241	2.5%	\$6,987	\$1,397	2.5%
% Industrial	109.2%	111.3%	111.8%	112.6%	3.4%	0.2%	0.2%	0.82%	0.16%	0.15%
Industrial Jobs										
Manufacturing	\$44,720	\$53,618	\$62,864	\$69,446	\$24,727	\$1,648	3.0%	\$6,583	\$1,317	2.0%
Logistics	\$48,325	\$53,344	\$60,719	\$70,832	\$22,507	\$1,500	2.6%	\$10,112	\$2,022	3.1%
Services	<u>\$41,040</u>	<u>46,314</u>	<u>53,068</u>	<u>61,058</u>	<u>\$20,018</u>	<u>\$1,335</u>	<u>2.7%</u>	<u>\$7,990</u>	<u>\$1,598</u>	<u>2.8%</u>
Subtotal	\$45,061	\$51,122	\$59,102	\$67,404	\$22,343	\$1,490	2.7%	\$8,302	\$1,660	2.7%

Source: Bureau of Labor Statistics; Economic & Planning Systems



Appendix

A.6 – Wage Trends by 3-Digit NAICS

Description	Code	2000	2005	2010	2015	2000-2015			2010-2015		
						Total	Ann. #	Ann. %	Total	Ann. #	Ann. %
Manufacturing											
Food Manufacturing	311	\$36,036	\$43,420	\$47,580	\$55,588	\$19,552	\$1,303	2.9%	\$8,008	\$1,602	3.2%
Beverage and Tobacco Product Manufacturing	312	\$38,116	\$44,876	\$49,348	\$50,024	\$11,908	\$794	1.8%	\$676	\$135	0.3%
Textile Product Mills	314	\$27,612	\$29,276	\$36,972	\$39,000	\$11,388	\$759	2.3%	\$2,028	\$406	1.1%
Apparel Manufacturing	315	\$26,052	\$37,128	\$25,948	\$26,780	\$728	\$49	0.2%	\$832	\$166	0.6%
Wood Product Manufacturing	321	\$30,784	\$36,296	\$36,036	\$41,288	\$10,504	\$700	2.0%	\$5,252	\$1,050	2.8%
Paper Manufacturing	322	\$43,472	\$44,252	\$49,816	\$57,720	\$14,248	\$950	1.9%	\$7,904	\$1,581	3.0%
Printing and Related Support Activities	323	\$36,452	\$41,444	\$44,408	\$48,204	\$11,752	\$783	1.9%	\$3,796	\$759	1.7%
Chemical Manufacturing	325	\$43,056	\$47,944	\$55,016	\$52,260	\$9,204	\$614	1.3%	-\$2,756	-\$551	-1.0%
Plastics and Rubber Products Manufacturing	326	\$49,348	\$59,436	\$72,696	\$76,700	\$27,352	\$1,823	3.0%	\$4,004	\$801	1.1%
Nonmetallic Mineral Product Manufacturing	327	\$38,740	\$42,016	\$44,096	\$55,172	\$16,432	\$1,095	2.4%	\$11,076	\$2,215	4.6%
Primary Metal Manufacturing	331	\$31,564	\$37,700	\$48,256	\$57,772	\$26,208	\$1,747	4.1%	\$9,516	\$1,903	3.7%
Fabricated Metal Product Manufacturing	332	\$34,788	\$40,820	\$46,332	\$51,688	\$16,900	\$1,127	2.7%	\$5,356	\$1,071	2.2%
Machinery Manufacturing	333	\$39,936	\$47,320	\$56,888	\$67,028	\$27,092	\$1,806	3.5%	\$10,140	\$2,028	3.3%
Computer and Electronic Product Manufacturing	334	\$53,144	\$63,284	\$75,660	\$55,380	\$2,236	\$149	0.3%	-\$20,280	-\$4,056	-6.0%
Electrical Equipment, Appliance, and Component Manufacturing	335	\$39,728	\$50,908	\$54,236	\$53,768	\$14,040	\$936	2.0%	-\$468	-\$94	-0.2%
Transportation Equipment Manufacturing	336	\$29,744	\$53,664	\$58,448	\$71,968	\$42,224	\$2,815	6.1%	\$13,520	\$2,704	4.2%
Furniture and Related Product Manufacturing	337	\$28,548	\$39,156	\$35,516	\$43,420	\$14,872	\$991	2.8%	\$7,904	\$1,581	4.1%
Miscellaneous Manufacturing	339	\$35,516	\$42,328	\$48,100	\$53,612	\$18,096	\$1,206	2.8%	\$5,512	\$1,102	2.2%
Subtotal		\$37,504	\$44,132	\$49,231	\$53,972	\$16,468	\$1,098	2.5%	\$4,741	\$948	1.9%
Logistics											
Merchant Wholesalers, Durable Goods	423	\$52,000	\$61,464	\$70,252	\$82,108	\$30,108	\$2,007	3.1%	\$11,856	\$2,371	3.2%
Merchant Wholesalers, Nondurable Goods	424	\$44,876	\$51,064	\$59,020	\$68,848	\$23,972	\$1,598	2.9%	\$9,828	\$1,966	3.1%
Wholesale Electronic Markets and Agents and Brokers	425	\$58,968	\$71,344	\$85,956	\$107,224	\$48,256	\$3,217	4.1%	\$21,268	\$4,254	4.5%
Air Transportation	481	\$48,100	\$45,864	\$48,360	\$73,372	\$25,272	\$1,685	2.9%	\$25,012	\$5,002	8.7%
Truck Transportation	484	\$33,852	\$40,300	\$40,456	\$47,632	\$13,780	\$919	2.3%	\$7,176	\$1,435	3.3%
Transit and Ground Passenger Transportation	485	\$34,060	\$36,764	\$40,820	\$46,800	\$12,740	\$849	2.1%	\$5,980	\$1,196	2.8%
Support Activities for Transportation	488	\$30,732	\$29,328	\$30,576	\$34,112	\$3,380	\$225	0.7%	\$3,536	\$707	2.2%
Warehousing and Storage	493	\$36,400	\$41,236	\$42,224	\$49,140	\$12,740	\$849	2.0%	\$6,916	\$1,383	3.1%
Subtotal		\$46,084	\$50,757	\$56,694	\$69,805	\$23,721	\$1,581	2.8%	\$13,111	\$2,622	4.2%
Services											
Utilities	221	\$60,112	\$69,108	\$85,956	\$93,340	\$33,228	\$2,215	3.0%	\$7,384	\$1,477	1.7%
Construction of Buildings	236	\$48,256	\$60,632	\$70,772	\$74,256	\$26,000	\$1,733	2.9%	\$3,484	\$697	1.0%
Heavy and Civil Engineering Construction	237	\$49,192	\$54,912	\$59,332	\$75,764	\$26,572	\$1,771	2.9%	\$16,432	\$3,286	5.0%
Specialty Trade Contractors	238	\$38,532	\$42,380	\$49,036	\$54,340	\$15,808	\$1,054	2.3%	\$5,304	\$1,061	2.1%
Repair and Maintenance	811	\$32,136	\$34,684	\$37,908	\$45,916	\$13,780	\$919	2.4%	\$8,008	\$1,602	3.9%
Subtotal		\$42,808	\$48,737	\$57,549	\$64,249	\$21,442	\$1,429	2.7%	\$6,700	\$1,340	2.2%
TOTAL		\$43,002	\$48,631	\$55,226	\$64,979	\$21,977	\$1,465	2.8%	\$9,753	\$1,951	3.3%

Source: Bureau of Labor Statistics; Economic & Planning Systems



Appendix

A.7 – Denver MSA Employment by Occupation

Description	Code	Industrial Job	2010	2011	2012	2013	2014	2015	2010-2015			
									Total	Ann. #	Ann. %	
Industrial Occupations												
Building and Grounds Cleaning and Maintenance	370000	1	39,150	38,350	39,910	39,690	41,830	41,980	2,830	566	1.4%	
Construction and Extraction	470000	1	53,110	49,990	50,030	53,880	60,020	64,880	11,770	2,354	4.1%	
Installation, Maintenance, and Repair	490000	1	45,950	45,460	45,920	46,300	48,180	50,910	4,960	992	2.1%	
Production	510000	1	44,490	45,810	46,260	47,310	47,600	51,110	6,620	1,324	2.8%	
Transportation and Material Moving	530000	1	<u>68,550</u>	<u>68,920</u>	<u>69,380</u>	<u>75,520</u>	<u>78,560</u>	<u>82,930</u>	<u>14,380</u>	<u>2,876</u>	<u>3.9%</u>	
Subtotal			251,250	248,530	251,500	262,700	276,190	291,810	40,560	8,112	3.0%	
Other Occupations												
Architecture and Engineering	170000	0	29,350	28,670	29,370	32,270	33,620	36,740	7,390	1,478	4.6%	
Arts, Design, Entertainment, Sports, and Media	270000	0	21,810	21,700	20,320	19,200	19,930	20,710	-1,100	-220	-1.0%	
Business and Financial Operations	130000	0	86,710	92,300	96,930	104,100	106,190	111,080	24,370	4,874	5.1%	
Community and Social Services	210000	0	14,050	13,720	14,040	14,890	14,910	16,480	2,430	486	3.2%	
Computer and Mathematical	150000	0	54,320	54,680	56,040	58,310	61,660	63,100	8,780	1,756	3.0%	
Education, Training, and Library	250000	0	62,660	63,810	65,580	68,100	71,680	72,830	10,170	2,034	3.1%	
Farming, Fishing, and Forestry	450000	0	0	1,170	1,240	1,320	1,470	1,600	1,600	320	---	
Food Preparation and Serving Related	350000	0	104,930	107,810	108,470	111,830	118,980	122,870	17,940	3,588	3.2%	
Healthcare Practitioners and Technical	290000	0	59,740	60,210	62,260	65,560	69,230	72,500	12,760	2,552	3.9%	
Healthcare Support	310000	0	28,250	29,710	29,730	28,910	35,740	33,610	5,360	1,072	3.5%	
Legal	230000	0	13,620	14,600	14,810	15,350	15,650	15,660	2,040	408	2.8%	
Life, Physical, and Social Science	190000	0	11,940	12,210	13,410	13,980	14,480	14,500	2,560	512	4.0%	
Management	110000	0	52,100	53,780	55,910	60,670	62,750	65,770	13,670	2,734	4.8%	
Office and Administrative Support	430000	0	197,420	198,020	202,650	207,100	205,190	206,720	9,300	1,860	0.9%	
Personal Care and Service	390000	0	31,380	33,690	37,190	39,800	39,840	44,510	13,130	2,626	7.2%	
Protective Service	330000	0	27,610	29,100	29,650	28,660	27,000	28,340	730	146	0.5%	
Sales and Related	410000	0	<u>135,750</u>	<u>137,000</u>	<u>141,830</u>	<u>147,490</u>	<u>150,920</u>	<u>155,440</u>	<u>19,690</u>	<u>3,938</u>	<u>2.7%</u>	
Subtotal			931,640	952,180	979,430	1,017,540	1,049,240	1,082,460	150,820	30,164	3.0%	
Total	000000		1,183,990	1,200,710	1,230,830	1,280,960	1,325,430	1,374,280	155,480	25,913	2.0%	

Source: Bureau of Labor Statistics; Economic & Planning Systems



Appendix

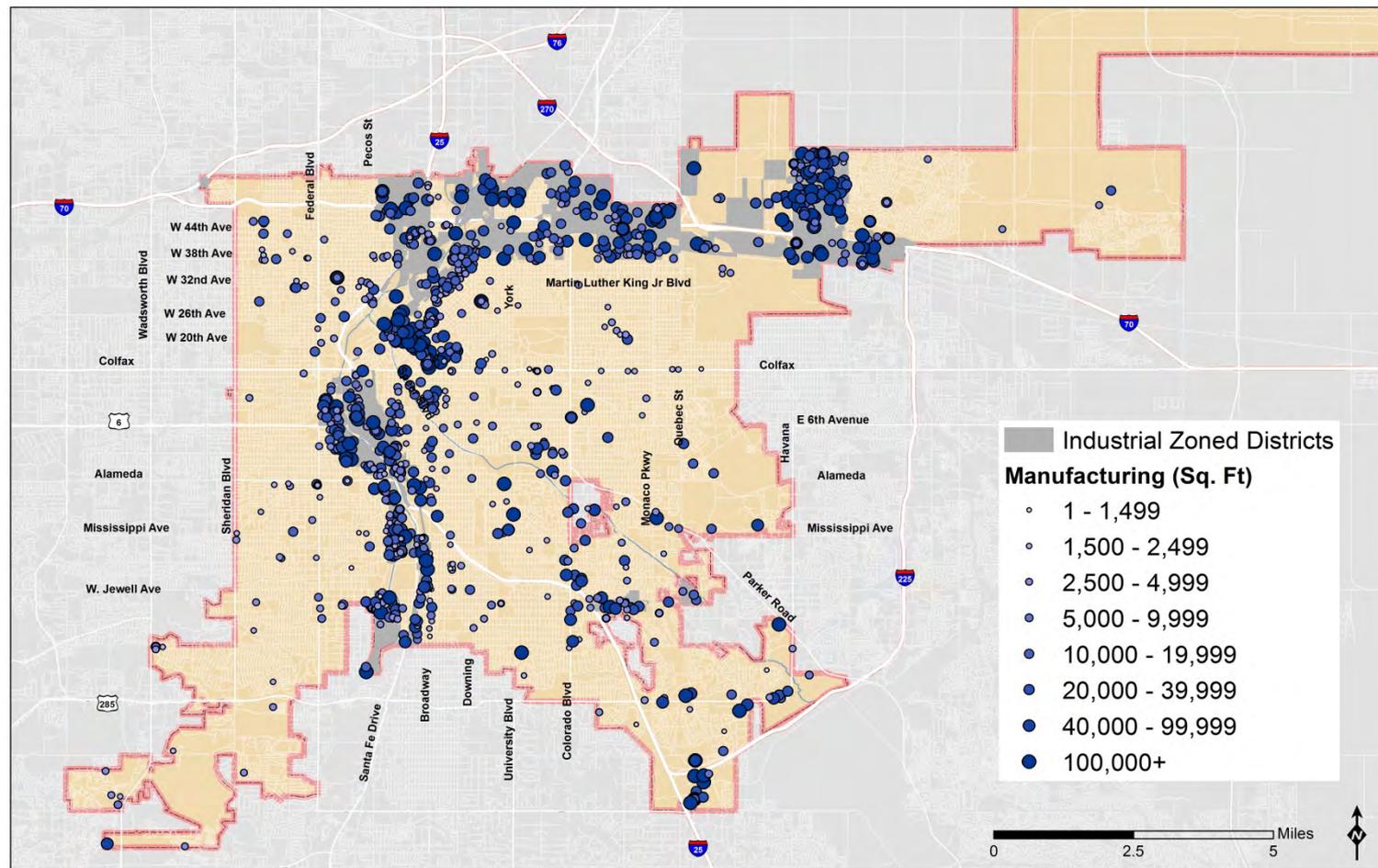
A.8 – Denver MSA Wage by Occupation

Description	Code	Industrial Job	2010	2011	2012	2013	2014	2015	2010-2015		
									Total	Ann. #	Ann. %
Industrial Occupations											
Building and Grounds Cleaning and Maintenance	370000	1	\$22,003	\$22,336	\$22,593	\$23,084	\$23,314	\$24,091	\$2,088	\$418	1.8%
Construction and Extraction	470000	1	\$39,198	\$39,308	\$40,562	\$40,629	\$41,078	\$41,958	\$2,760	\$552	1.4%
Installation, Maintenance, and Repair	490000	1	\$43,387	\$43,880	\$44,399	\$45,194	\$46,635	\$47,217	\$3,830	\$766	1.7%
Production	510000	1	\$31,755	\$32,547	\$32,607	\$33,327	\$32,587	\$32,627	\$872	\$174	0.5%
Transportation and Material Moving	530000	1	<u>\$31,613</u>	<u>\$31,826</u>	<u>\$32,276</u>	<u>\$32,040</u>	<u>\$32,976</u>	<u>\$32,837</u>	<u>\$1,224</u>	<u>\$245</u>	<u>0.8%</u>
Weighted Average			\$33,897	\$34,204	\$34,662	\$34,999	\$35,589	\$36,079	\$2,181	\$436	1.3%
Other Occupations											
Architecture and Engineering	170000	0	\$76,312	\$76,764	\$78,963	\$80,649	\$81,643	\$82,073	\$5,761	\$1,152	1.5%
Arts, Design, Entertainment, Sports, and Media	270000	0	\$45,821	\$45,995	\$44,857	\$45,983	\$46,413	\$47,592	\$1,771	\$354	0.8%
Business and Financial Operations	130000	0	\$63,702	\$65,198	\$65,894	\$67,779	\$69,740	\$70,883	\$7,181	\$1,436	2.2%
Community and Social Services	210000	0	\$40,632	\$42,271	\$42,942	\$43,384	\$44,543	\$45,270	\$4,638	\$928	2.2%
Computer and Mathematical	150000	0	\$79,865	\$79,426	\$79,983	\$82,427	\$87,066	\$90,331	\$10,466	\$2,093	2.5%
Education, Training, and Library	250000	0	\$47,100	\$47,069	\$46,846	\$46,602	\$46,127	\$47,230	\$130	\$26	0.1%
Farming, Fishing, and Forestry	450000	0	\$23,512	\$24,305	\$25,736	\$26,201	\$26,355	\$25,611	\$2,099	\$420	1.7%
Food Preparation and Serving Related	350000	0	\$18,812	\$18,905	\$19,160	\$19,155	\$19,136	\$19,471	\$659	\$132	0.7%
Healthcare Practitioners and Technical	290000	0	\$65,903	\$66,731	\$67,662	\$68,385	\$69,541	\$69,654	\$3,751	\$750	1.1%
Healthcare Support	310000	0	\$28,907	\$28,586	\$28,805	\$30,841	\$31,327	\$31,711	\$2,804	\$561	1.9%
Legal	230000	0	\$72,092	\$75,707	\$80,420	\$82,910	\$77,163	\$79,387	\$7,295	\$1,459	1.9%
Life, Physical, and Social Science	190000	0	\$65,781	\$67,100	\$63,678	\$63,659	\$64,786	\$66,828	\$1,047	\$209	0.3%
Management	110000	0	\$103,850	\$107,346	\$108,583	\$111,186	\$112,581	\$116,438	\$12,588	\$2,518	2.3%
Office and Administrative Support	430000	0	\$34,938	\$35,467	\$35,317	\$35,559	\$36,121	\$37,029	\$2,091	\$418	1.2%
Personal Care and Service	390000	0	\$22,409	\$22,041	\$21,808	\$21,623	\$21,960	\$22,216	-\$193	-\$39	-0.2%
Protective Service	330000	0	\$38,985	\$37,369	\$34,526	\$36,983	\$38,564	\$36,132	-\$2,853	-\$571	-1.5%
Sales and Related	410000	0	<u>\$31,329</u>	<u>\$31,240</u>	<u>\$30,282</u>	<u>\$29,599</u>	<u>\$30,228</u>	<u>\$30,436</u>	<u>-\$893</u>	<u>-\$179</u>	<u>-0.6%</u>
Weighted Average			\$46,647	\$47,163	\$47,330	\$48,428	\$49,335	\$50,421	\$3,773	\$755	1.6%
Total	000000		\$38,894	\$39,231	\$39,210	\$39,954	\$40,368	\$41,245	\$2,351	\$470	1.2%

Source: Bureau of Labor Statistics; Economic & Planning Systems

Appendix

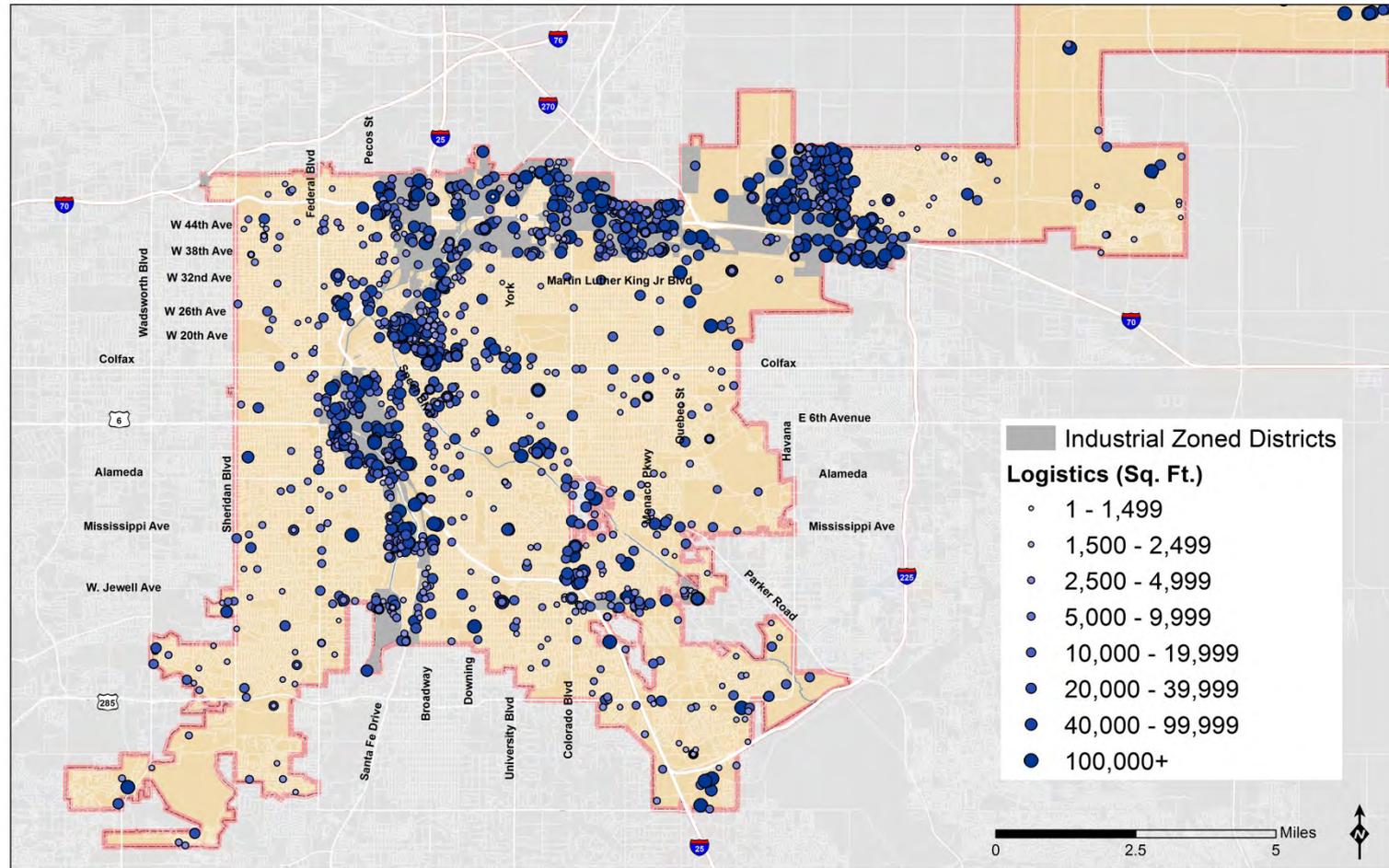
A.9 – Size of Firms - Manufacturing



Source: InfoGroup; Economic & Planning Systems

Appendix

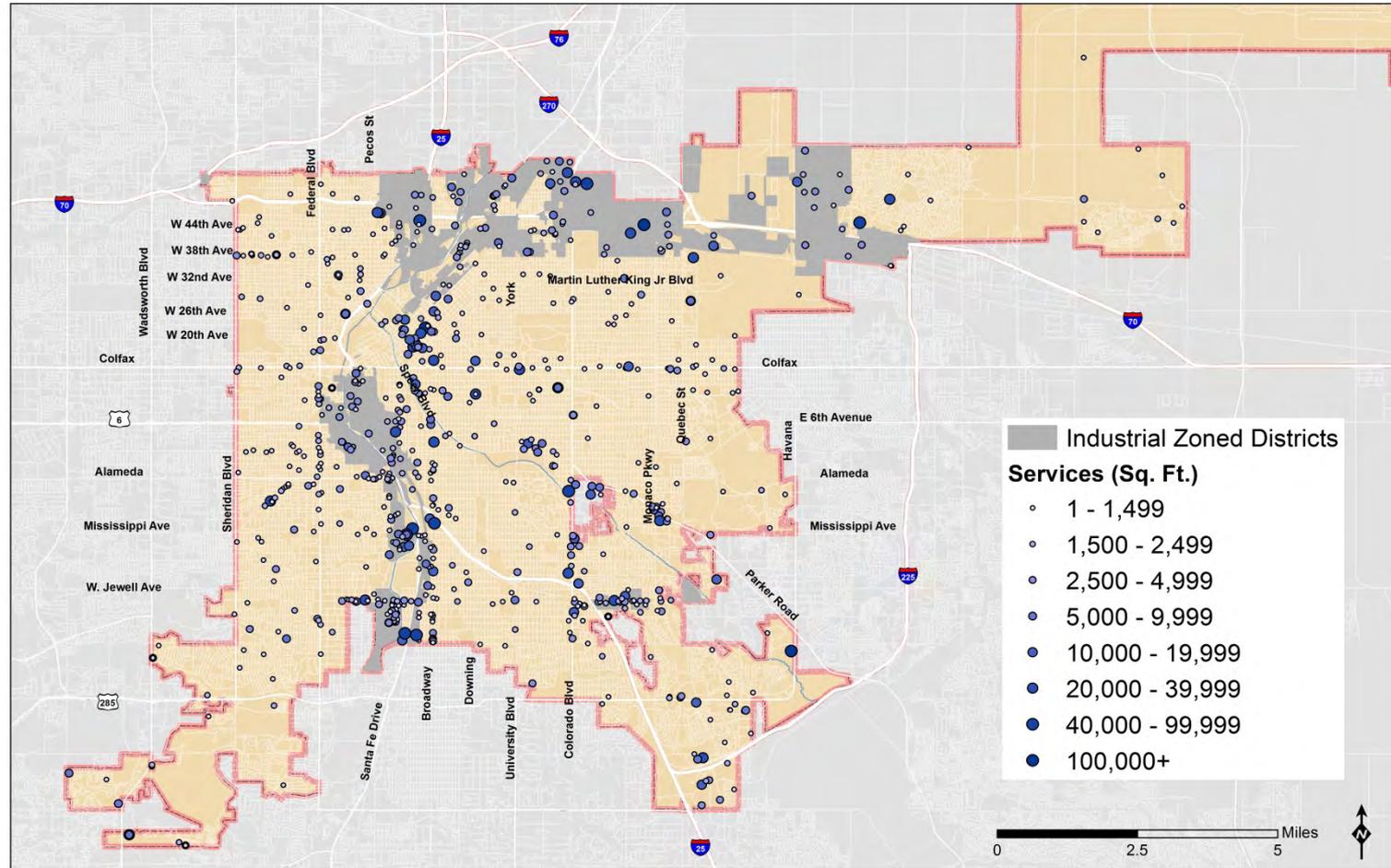
A.10 – Size of Firms - Logistics



Source: InfoGroup; Economic & Planning Systems

Appendix

A.11 – Size of Firms - Services



Source: InfoGroup; Economic & Planning Systems

Appendix

A.11 – Industrial Supply by Subarea

Subareas	# of Buildings	Rentable Building Area (RBA) (Square Feet)	% of Total RBA	Average RBA (Square Feet)	Average Parcel Size (Acres)	FAR	RBA Added Since 1999	% of New RBA	Demolished RBA Since 1999	% of Demolished RBA
North Central	626	16,225,550	19%	25,919	1.87	0.32	847,655	8%	3,405,893	42%
Northeast	933	46,541,804	54%	49,884	3.47	0.33	8,776,988	86%	437,818	5%
South Platte Corridor	1,052	18,749,006	22%	17,822	1.07	0.38	421,416	4%	1,915,276	24%
Evans Corridor	64	1,272,299	1%	19,880	1.35	0.34	30,887	0%	66,660	1%
Outside of Industrial Areas	315	3,381,759	4%	10,736	0.51	0.48	86,581	1%	2,212,309	28%
Total	2,990	86,170,418	100%	28,820	2.20	0.30	10,163,527		8,037,956	
Average	---	---		28,820	1.93					

Source: CoStar; Economic & Planning Systems